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**Latino mothers in rural America:
A mixed methods assessment of maternal depression**

by
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A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Human Development and Family Studies

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ABSTRACT

This dissertation examined depression among rural Latino women using two studies—one using quantitative methodologies and another using mixed methods design. Data were from a multi-state longitudinal project that tracked the well-being and functioning of low income rural families in the context of welfare reform. For one study, latent growth curve modeling (LGC) was used to test for moderation of race/ethnicity on the relationship between food security status, social service use, and depressive symptoms. For the other study, chi-square and t-test analyses were used to test for differences between two groups of Latino women—those who maintained a consistently low level of depressive symptoms and those who maintained a consistently high level of depressive symptoms. Also, qualitative analyses were used to determine commonalities and differences among those same groups of Latino women. The data showed that factors that influenced depression were complex and multi-faceted. The latent growth curve modeling showed that ethnicity moderated the relationship between food insecurity status and depressive symptoms with higher initial levels of food insecurity associated with higher initial levels of depressive symptoms. Using qualitative inquiry in a mixed methods design shed light on the mothers who maintained low depressive symptoms throughout this longitudinal study and highlighted the significance that one's family of origin has throughout life, specifically how a caring and supportive relationship with one's parents and siblings appears to buffer an individual from life's difficult circumstances and thus safeguard one's mental health. A meaningful extension of this dissertation would be to focus on the influence of family of origin on levels of depression and food security later in life. Further work needs to consider differing patterns of association with food insecurity and maternal depression based on earlier familial relationships and child outcomes.

Keywords: depressive symptoms, food insecurity, latent growth curve modeling, mixed methods

CHAPTER 1 GENERAL INTRODUCTION

Introduction

According to the U.S. Census Bureau (2006b), the Latino¹ population is the largest and fastest growing minority group in the nation and is projected to become the largest ethnic group in the United States by the year 2050 with one out of every four United States residents being of Latino heritage (Soto, 2000). Currently, Latinos comprise 12.5% of the total U.S. population which is a 57.9% increase since 1990 (U.S. Census Bureau, 2006b). Furthermore, in pockets of rural America, Latinos are the fastest growing population, reversing the gradual population decline that has been occurring since the 1950's in a few states and a few counties within these states (U.S. Census Bureau, 2006a). Although living in rural America has its challenges to well-being, such as rising costs of essential goods, higher unemployment than in urban areas, limited access to inadequate healthcare facilities, limited affordable housing and healthcare, and considerable geographical distances (Housing Assistance Council, 1997; Soto, 2000), Latinos in rural areas face additional hardships that further complicate their well-being. In this dissertation, I will focus on the particular challenge of depression among first- and second-generation rural, immigrant Latino mothers.

Latino Immigrant Families in Rural America

In addition to the overall challenges to well-being in rural communities, Latino immigrants often experience stressors during their adjustment to their new country. They may experience feelings of loss when living far-away from their family back home, discrimination, stress associated with unemployment and/or low income, feelings of not belonging to their new community, and feelings of apprehension and disorganization as they navigate their unfamiliar environment (Hovey & Magaña, 2000; van Ecke, 2005). Furthermore, Latino immigrant families may face even more adversities due to low educational attainment, language barriers, reduced social networks, and lack of legal documentation, and knowledge and availability of community resources, all of which may result

in reduced capacity to meet basic needs (Delgadillo, Sorensen & Coster, 2004; Kandel & Newman, 2004; Le, Lara, & Perry, 2008; Long, 2003; Nord, Andrews & Carlson, 2008; Quinn, 2001; Sullivan & Ziegart, 2008).

As a result of these challenges, Latino immigrants often live in poverty. The poverty rate of Latino immigrant households is 23.4%, nearly twice as high as non-Latino immigrant households (Sullivan & Ziegert, 2008). Furthermore, 26.7% of rural Latinos live below the federal poverty line compared to 11% of rural non-Latino whites; Latino children have a poverty rate of 29% (U.S. Census, 2006b). The presence of Latino immigrant families in rural communities may stress local resources as these families are more likely to be unable to meet their basic needs (Long, 2003; Nord et al., 2008).

Poverty makes it difficult for a family to meet its basic needs. Two challenges Latino immigrant families in rural communities may face are: (a) depression and (b) food insecurity. While progress has been made to respond to mental health needs of the Latino population in general, relatively little attention has been focused on the needs of Latino immigrants residing in rural America. Furthermore, research indicates that 24% to 69% of all rural women exhibit depressive symptoms (Hauenstein & Boyd, 1994; Hauenstein & Peddada, 2007; Sears, Danda, & Evans, 1999; Simmons, Huddleston-Casas, & Berry, 2007; Wijnberg & Reding, 1999).

According to Martínez Pincay and Guarnaccia (2007), Latinos experience depression at higher rates than other minorities. However, Latinos, and especially Latino immigrants, receive few mental health services. Identification of barriers to mental health in Latino immigrant women can help health care practioners develop interventions to prevent depression and to promote well-being among all Latinos, not just Latino immigrant women.

While food insecurity has been associated with poverty and maternal depression (Whitaker, Phillips, & Orzol, 2006), relatively little attention has been focused on food accessibility among Latino immigrant families residing in rural America. According to Nord and Coleman-Jensen (2009),

while not distinguishing between immigrants and native born citizens, the rate of food insecurity among Latino households is nearly double the national rate, 26.7% and 14.6%, respectively. Food insecurity among rural Latino families tends to be magnified by environmental factors such as poor quality housing and community isolation. Latino immigrant families also tend to live in spatial isolation from non-Latinos and in close proximity to other Latino immigrant families (Kandel & Newman, 2004), which limits their access to critical information about local support services (Delgadillo et al., 2004). These environmental factors, in conjunction with diminished social support, can lead to increased stress levels which exacerbate depressive symptoms in both first- and second-generation Latino immigrants.

Dissertation Organization

This dissertation will consist of four chapters: (a) Chapter 1: General Introduction, (b) Chapter 2: Food Insecurity and Maternal Depression among Latina, African American, and Caucasian Low-income Mothers in Rural America: A Latent Growth-Curve Analysis, (c) Chapter 3: A Longitudinal Look at Maternal Depression Among Rural Latino Immigrant Mothers: A Mixed Methods Design, and (d) Chapter 4: General Conclusions.

In Chapter 1: General Introduction, the reader will become acquainted with the literature and data set used for this dissertation. Chapter 1 will consist of five parts: (a) Introduction, (b) Dissertation Organization, (c) Literature Review, (d) Rural Families Speak Project data set, and (e) References. Chapters 2 and 3 will consist of two manuscripts for submission to scholarly journals.

Chapter 2: Food Insecurity and Maternal Depression among Latina, African American, and Caucasian Low-income Mothers in Rural America: A Latent Growth-Curve Analysis will contain the first of two manuscripts and will consist of the following elements: (a) Abstract, (b) Introduction, (c) Methods, (d) Results, (e) Discussion and Conclusion, and (f) References. Similar to the previous chapter, Chapter 3 will contain the manuscript, A Longitudinal Look at Maternal Depression Among

Rural Latino Immigrant Mothers: A Mixed Methods Design, and will consist of the same seven sections as noted for Chapter 2 above.

Chapter 4: General Conclusions will consist of the combination of the findings and discussion about depression among Latino immigrant mothers in rural America. Chapter 4 will consist of the following parts: (a) General Discussion, (b) Recommendations for Future Research, and (c) References. This more in-depth look at depression among first- and second-generation Latino immigrant women will give us a greater understanding of the interplay between maternal depression and food insecurity among these women.

Literature Review

Personal Responsibility and Work Opportunity Reconciliation Act

Despite positive changes such as reduced poverty rates, lower out-of-wedlock child bearing, and greater family stability (Litcher & Jayakody, 2002) some of which were achieved as a result of the 1996 welfare reform bill, Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), significant poverty still remains among certain sectors of society including rural and Latino families. In comparison to urban states, most predominately rural states provide low Temporary Assistance to Needy Families (TANF) benefits. Yet rural families face serious barriers to work such as limited employment opportunities, low wages, underemployment, lack of child care, and chronic transportation issues (Litcher & Jayakody, 2002). Furthermore, welfare-eligible families in rural areas are less likely to receive welfare benefits when compared to their urban counterparts (Litcher & Jayakody, 2002). Stigma, limited knowledge of eligibility, and ineffective local welfare offices are barriers to welfare use among the rural poor (Litcher & Jayakody, 2002).

Between 1990 and 1999, Latinos increased from 17% to 25% of all social service caseloads (U.S. Department of Health and Human Services, 2007). At the same time, immigrant provisions in PROWRA greatly reduced the social services available to legal immigrants (U.S. Department of Health and Human Services, 2007). Immigrants who legally entered the United States after 1996 are

no longer eligible for Supplemental Security Income (SSI), Supplemental Nutrition Assistance Program (SNAP, formerly known as Food Stamps), Medicaid, and TANF for the first five years they reside in the U.S. After this five year period, states have the option to provide social service benefits to documented immigrants (U.S. Department of Health and Human Services, 2007). Undocumented immigrants, however, are only eligible for emergency medical services. Furthermore, many eligible Latinos do not participate in these social service programs due to fear of deportation and confusion about program restrictions (National Council of La Raza, 2006).

When poverty overwhelms any family as it does many rural families and the family's use of governmental support programs is curtailed, family members may have a difficult time meeting their basic needs. Similarly, rural Latino families have a hard time meeting their needs as well. As a result, two challenges that Latino immigrant families in rural communities may face are: (a) maternal depression and (b) food insecurity.

Maternal Depression

Depression is a mental disorder distinguished by symptoms of persistent sadness, loss of interest or pleasure, feelings of guilt or low self-worth, upset sleep or eating patterns, low energy, and poor concentration. These symptoms can become recurrent or chronic and lead to significant impairments in a person's ability to take care of one's daily responsibilities (U.S. Department of Health & Human Services, 2001; World Health Organization, 2008).

Depression is increasingly recognized as a leading cause of disease burden among women and girls worldwide (Lazear, Pires, Isaacs, Chaulk, & Huang, 2008). According to the World Health Organization (WHO), depression is currently the fourth most common health disorder for women worldwide. In addition, by 2020, depression is expected to be second only to heart disease for women around the world. As one of the most widespread diseases worldwide, including a significant cause of disability, depression is responsible for nearly 20% of visits to primary care physicians (Huang, Wong, Ronzio, & Yu, 2007). In the U.S., approximately 12 million women experience

depression, twice the rate of men (Huang et al., 2007; Lazear et al., 2008). In addition, in the U.S. depression is the major cause for women being hospitalized after childbirth (Lazear et al., 2008).

Although depression affects members of all racial and ethnic groups, due to poverty and other contextual factors (Cutrona, Wallace, & Wesner, 2006) low-income women have a frequency of depression that is twice as high as for non-low-income women, 25% and 12% respectively (Lazear et al., 2008). Among Latino women, Huang et al. (2007) found a depressive symptomatology rate of approximately 38%. However, Latino women are less likely to seek mental health services when they are depressed (Martinez Pincay & Guarnaccia, 2007). Therefore, understanding depression from the viewpoint of Latino women is especially important.

Research on depression indicates that Latino women, immigrants in particular, face many of the same risks associated with depression as other women in the United States. However, Latino women face additional challenges to positive mental health as well. In order to understand depression among Latino women, several of these risks to positive mental health will be discussed. Because these risks generally do not occur in isolation, understanding how the risks are interrelated in meeting an individual's or family's ability to meet its mental health needs is essential.

Ecological Theory of Human Development and Maternal Depression

The ecological theory of human development (Bretherton, 1993) focuses on an individual's relationship within one's social contexts and suggests that human development occurs in a set of overlapping ecological systems that operate together to influence what an individual becomes as he/she develops. Bronfenbrenner and Morris (1998) described four levels of influence faced by families as they attempt to maximize their well-being. These levels of influence are reciprocal and interconnected, affecting the ability of an individual or family to meet its needs.

The four levels of influence include the microsystem (i.e., individuals and families), the mesosystem (i.e., social networks), the exosystem (i.e., community), and the macrosystem (i.e., larger cultural context). For example, at the individual and family levels, characteristics of the family and

family members such as employment status and human capital accumulation (e.g., educational level) affect decision making and allocation of resources. Next, social networks also provide support to households in meeting their emotional and physical needs. Families with wider social networks are generally able to employ a greater number of resources (Greder, Cook, Garasky, & Oritz, 2008). In addition, organized social support within a community, such as public assistance programs, provides families with additional services. The rural context plays an essential role in that rural communities generally offer fewer employment, educational, and training opportunities, and less access to childcare, transportation, and family support services (Weber, Duncan, & Whitener, 2001). Finally, the larger society also affects families through social policy, culture, and the broader economic environment. All these factors profoundly affect the ability of individuals to meet their mental health needs. Although the current study looks only at the microsystem, all levels are described to provide an understanding of how the microsystem fits within the ecological framework.

Microsystem: Individual and family factors. Among Latino women, several individual and family factors influence the level of depressive symptoms. These factors include: (a) stressful life events, (b) employment level, (c) financial stress, (d) nutritional intake, and (e) acculturation. First, life stressors, such as homelessness, family violence, incarceration, unexpected death of a family member, or the immigration experience, may act as potentially chronic stressors (Dolan, Richards, Sano, Bauer, & Braun, 2005; Huang et al., 2007). According to Lazear, Pires, Isaacs, Chaulk, and Huang (2008), women who immigrate to the United States find their new lives extremely stressful because of the relentless pressure to find employment, earn money, settle immigration status issues, learn a new language, and find affordable and tolerable transportation and housing, while leaving behind family and friends. The result can be feelings of extreme sadness and isolation. Difficult life events are related to high levels of stress with chronic levels of stress influencing higher levels of depression (Keller, Neale, & Kendler, 2007).

Next, among low-income women, employment has been found to influence depressive symptoms. Mothers who work more hours resulting in lower poverty levels and who perceive their economic situation as positive tended to have fewer depressive symptoms (Simmons, 2006a). In addition, women who were unemployed or worked part-time were more likely to be depressed (Braun, 2003; Dolan et al., 2005; Kim, Seiling, Stafford, & Richards, 2005).

In addition to the link between employment status and depression, the discrepancy between Latino and non-Latino employee wages is an important distinction to be made since it is tied to one's economic situation. Latino immigrants typically earn 24% less than natives in similar positions (Hall & Farkas, 2008). Reasons for this discrepancy include poor English proficiency and lower educational attainments (Hall & Farkas, 2008; Hamilton, Goldsmith, & Darity, 2008). When examining years of schooling and wages among low-skill immigrant and native male workers in the United States, each additional year of schooling is accompanied by an increase in wages. However, among Latinos this return for education is essentially absent (Hall & Farkas, 2008).

The third individual and family factor found to influence the level of depressive symptoms among rural women is financial stress. Researchers have found that the way a woman perceives her financial situation influences her level of depressive symptoms (Dolan et al., 2005; Marghi, 2004; Piescher, 2004; Simmons, 2006b; Simmons, Braun, Charnigo, Havens, & Wright, 2008). While the actual household income is important, how one perceives her family's income, either as increasing, decreasing, or staying the same, has been linked to depression. The more negative one's view, the more depressive symptoms have been found.

In addition, acculturation has been found to influence depressive symptoms. Acculturation, the process in which an immigrant acquires the new society's beliefs, behaviors, and values while abandoning some of the beliefs, behaviors, and values of one's culture of origin (Elder, Broyles, Brennan, Zúñiga de Nuncio, & Nader, 2005; Hwang & Wood, 2009), has been linked to depression (Elder et al., 2005; Hwang & Wood, 2009; Rivera, 2007). In addition, acculturation has been linked

with decreased health status among first- and second-generation Latino immigrants. This decreased health status has been called the “health paradox” since the health status of Latino immigrants is negatively correlated with the length of time they have been in the United States (Riffe, Turner, & Rojas-Guyler, 2008). Furthermore, poor physical health has been associated with more depressive symptoms (Dolan et al., 2005; Huang et al., 2007; World Health Organization, 2001).

Mesosystem: Social network factors. Among rural Latino women, social network factors play an important role in their well-being. Social support is the physical and emotional assistance given to an individual by one’s family, friends, co-workers and others. Social support allows an individual to know that one is loved and cared for by others. Furthermore, social support does not represent support unless the recipient views it as such. Social network factors that influence depression levels include: (a) social support, (b) transnational ties, and (c) family stressors.

First, positive social support occurs in many ways for rural women. Seiling (2006) found that rural mothers received continuing help from family and friends with daily living needs to help in emergencies. The social support assisted women in finding and maintaining employment primarily by meeting transportation and child care needs and providing information about finding and maintaining employment. Social support networks can also provide positive social support by passing on knowledge about available community resources such as health services and social and religious activities (Cabassa, Lester, & Zayas, 2007; Finch & Vega, 2003; Seiling, 2006). Furthermore, according to Vandergriff-Avery (2001) both perceived and actual support received were factors in rural, low-income women’s ability to elude depression. In general, the larger the social network, the lower the depressive symptoms.

For Latino women, social support, especially family support, is of special interest since it serves an important buffering function in mental health because of the importance of family values in this cultural group. Rivera (2007) found a significant relationship between acculturation and depression that was mediated by family social support. This is important within the Latino

community as it is the larger, extended family that establishes the stability and facilitates positive mental health outcomes (Riffe et al., 2008). However, immigrants often enter the United States without their immediate or extended family members, leaving behind critical social support networks as they enter unfamiliar and potentially unwelcoming surroundings (Elder et al., 2005; Riffe et al., 2008). Furthermore, first- and second-generation Latino immigrant women have been found to rely on family social support while rarely using social service agencies due to their perception of these agencies as untrustworthy due to the agencies' lack of cultural understanding of the Latino community (Domínguez & Lubitow, 2008).

Next, transnational ties can serve as a form of social support among low-income, immigrant women. Transnational ties refer to the ways in which individual lives are influenced by circumstances in two countries, the country of origin and the receiving country. The support provided by family members left back home cannot be underestimated. Domínguez and Lubitow (2008) found that among Latino immigrant women, these transnational ties with family from their native country provided an essential social connection and support network that actively reduced feelings of social isolation, alleviated stress, and reduced discrimination effects. In addition, transnational ties allowed some first-generation Latino immigrants to purchase a house and land for future use in their countries of origin representing a great step in social mobility for these immigrants (Domínguez & Lubitow, 2008).

However, for many immigrant women, transnational ties can also serve as a family stressor. These connections may become a burden if the immigrant families are expected to provide economic resources, temporary housing, or employment connections to other family members (Domínguez & Lubitow, 2008). In addition, when relationships with family members or friends are not good, the women find that they cannot rely on these relationships for help (Seiling, 2006).

Also, when parents and children have differing acculturation rates, family conflict arises. Parents may not be able to effectively communicate affect with their children resulting in a lack of

emotional connection with their children (Hwang & Wood, 2009). This language gap has been found to be associated with family stress and conflict. As a chronic stressor, family conflict has been found to mediate the relationship between acculturation and depressive symptoms for Latino college students (Hwang & Wood, 2009).

Exosystem: Community factors. Several community factors influence the level of depressive symptoms among low-income and Latino women. These factors include: (a) rural living, (b) neighborhoods, and (c) healthcare. Depression in rural women is a serious health concern. While depression is not unique to rural communities, the high prevalence of depression in rural women is made worse by high rural poverty rates with more than 20% of rural households earning incomes at or below the federal poverty line, compared to 14.3% for urban areas (Simmons et al., 2008). According to Braun (2003) found 41% of rural women were in a national study were anxious or depressed compared to less than 20% of their urban counterparts. In addition, 40% of visits to rural general family practitioners are due to stress.

Recent research indicated that depression may be linked to neighborhood characteristics (Cutrona et al., 2006; Wickrama & Bryant, 2003). Some neighborhoods provide few role models for competently fulfilling family roles. Therefore spousal and parent-child relationships may suffer, resulting in depression among both adults and children (Cutrona et al., 2006; Wickrama & Bryant, 2003). Neighborhood poverty has predicted both lower-quality parenting behaviors and spousal relationships which included low levels of warmth with less affectionate and responsive behaviors (Tendulkar, Buka, Dunn, Subramanian, & Koenen, 2010). Low warmth may lead to family conflict and marital problems which have been shown to predict depression (Cutrona et al., 2006; Wickrama & Bryant, 2003). Furthermore, neighborhood characteristics may interfere with the formation of social relationships between neighbors which in turn lead to inadequate social support and depression (Cutrona et al., 2006).

Both rural communities and low-income neighborhoods tend to have less accessible healthcare (Braun, 2003; Cutrona et al., 2006). However, due to the shortage of mental health professionals in rural communities, many mental health problems are seen by general health practitioners. Furthermore, Bennett and Dismuke (2010) found in a national sample that rural residents have higher out-of-pocket to total income spending ratios, than their urban counterparts do, placing them at a greater financial risk.

Macrosystem: Larger cultural contextual factors. Among Latino women, larger cultural contextual factors include: (a) governmental social and immigration policies and (b) cultural values of the women. First, governmental social and immigration policies may influence depression by the way they are designed to meet the needs of families. The services available to documented immigrants were reduced by the welfare reform act of 1996 (U.S. Department of Health & Human Services, 2007). However, many eligible Latinos do not participate in these programs due to confusion about program restrictions (National Council of La Raza, 2006).

Next, cultural values of Latino women also play a part in how they cope with depressive symptoms. Latino women believe that depression is primarily caused by interpersonal, social factors such as social pressures and life circumstances including family conflict and lack of emotional support system (Cabassa et al., 2007). This belief reflects the importance that Latinos place on the family unit and the cultural value known within the Latino community as *familism*. Familism refers to the significance of the family in everyday life and identity of Latino individuals. “It reflects solidarity, loyalty, cohesion, and reciprocity with nuclear and extended family members as well as viewing the family as an important source of emotional and instrumental support” (Cabassa et al., 2007, p. 12). In addition, Martínez Pincay and Guarnaccia (2007) found that Latino immigrants viewed positive mental health as being associated with self-control and spirituality.

Since Latino women believe that depression is a result of difficult life events, they rarely seek mental health services immediately (Martínez Pincay & Guarnaccia, 2007). In addition, many times

Latino immigrants perceive depression as being caused by interpersonal and social factors, such as being alone or isolated from others (Cabassa et al., 2007; Martínez Pincay & Guarnaccia, 2007). Furthermore, treatment may not be immediately sought, and once it is sought, counseling is preferred to medications which are seen as addictive (Martínez Pincay & Guarnaccia, 2007). Moreover, medications carry a stigma signaling that someone is crazy and unable to provide self care (Martínez Pincay & Guarnaccia, 2007). Many times traditional folk practices and remedies are first used to treat depression (Lopez, 2005).

Barriers to Mental Healthcare

With respect to mental healthcare for rural Latino women, several barriers have been cited. These barriers include the following: (a) language barriers and expectations, (b) cultural insensitivity and bias, (c) stereotypes and different cultural norms for family life, (d) lack of insurance combined with cost of services, (e) stigma, (f) transportation issues, (g) concerns about immigration status, and (h) lack of knowledge about services (Braun, 2003; Cabassa et al., 2007; Garcés, Scarinci, & Harrison, 2006; Lazear et al., 2008; Martínez Pincay & Guarnaccia, 2007; Riffe et al., 2008; Soto, 2000). In fact, Latinos are more likely to be seen by general physicians who may fail to correctly diagnose depression. In addition, when receiving care for depression, Latinos are less likely to receive the most current care available (Cabassa et al., 2007).

The four levels of influence—the microsystem, the mesosystem, the exosystem, and the macrosystem—are all intertwined and connected to the particular circumstances in which an individual lives. For Latino immigrant women, all levels of influence come together in their lives as a result of their social and economic positions in the United States—the types of employment and resulting wages they have, the uncertainties produced by their immigration status, the discrimination they experience, the multiple demands of supporting family in the U.S. and family in their native country, and the separation from supportive social networks. While the additive nature of all these influences seems intense, Latino immigrants as a group have better mental health than U.S-born Latinos

(Martínez Pincay & Guarnaccia, 2007; Vega, Kolody, Aguilar-Gaxiola, Alderete, Catalano, & Caraveo-Anduaga, 1998). But for those Latino immigrants who do develop depression, both the sources of depression and the barriers to care are determined by a myriad of factors.

Food Insecurity

In the United States, 14.6 % of households are food insecure—the highest recorded since 1995 (Nord, Andrews, & Carlson, 2009). The United States Department of Agriculture (USDA) recognizes a household as being food secure if all household members have access at all times to enough food for an active, healthy lifestyle. In contrast, a household is identified as food insecure if at times household members are uncertain of having or unable to acquire enough food for all members due to insufficient money and other resources for food, with subcategories of households as having either low food security or very low food security (Nord, Andrews, & Carlson, 2008).

Numerous factors affect whether or not a household experiences food insecurity and its accompanying consequences. Higher probabilities of food insecurity are associated with the following: (a) lower incomes and asset levels, (b) fewer ties to the labor force, (c) not having health insurance, (d) residing in a household headed by a single mother, (e) lower education levels, (f) limited access to social capital, (g) more household members, (h) depression, (i) illicit drug use, (j) homelessness, (k) being in a domestic violent relationship, and (l) residing in a household headed by an African American or Latino (Martin, Rogers, Cook, & Joseph, 2004; Mazur, Marquis, & Jensen, 2003; Nord et al., 2008).

Studies examining food insecurity among Latino households have produced conflicting results. Some studies report that food insecurity among Latino households is in part due to factors such as low-income and low education which are more common among Latinos than among their non-Latino white counterparts. Other studies have found that Latino households are at a higher probability of food insecurity even after controlling for income (Alaimo, Briefel, Frongillo, & Olson, 1998; Kaiser, Baumrind, & Dumbald, 2007; Mazur et al., 2003). Factors, including lower linguistic

acculturation, lower parental education, and lower household income, have been negatively linked with a greater likelihood of food insecurity among Latinos (Kaiser, Melgar-Quinoz, Lamp, John, & Harwood, 2002; Mazur et al., 2003).

Recently, Capp, Horowitz, Fortuny, Bronte-Tinkew, and Zaslow (2009) found that citizenship predicts food security, with a higher prevalence of food insecurity among noncitizens than among native born and naturalized citizens. In addition, the prevalence of food insecurity was twice as high among families where no adults spoke English effectively compared to those families in which the adults were proficient in English.

Research has also documented the negative mental health associations with food insecurity. Children in food insecure households were more likely to have clinical levels of psychological dysfunction (Kleinman et al., 1998), to have seen a psychologist (Alaimo et al., 2001), and to experience anxiety and depression (Weinreb, Wehler, Perloff, Scott, Hosmer, Sagor, & Gundersen; 2002), compared to children in food secure households.

Mental health risks related to food insecurity are also high for adults, especially for women. Since women are predominantly responsible for meal planning, grocery shopping, and food preparation in their households, low-income mothers often forgo their nutritional needs to ensure their children have more food (Braun, 2003; McIntyre, Glanville, Raine, Dayle, Anderson, & Battaglia, 2003; Olson, 2005). Food insecurity and an inadequate diet are significantly associated with negative consequences in adults including poorer health and depression (Olson, 2005).

Ecological Theory of Human Development and Food Insecurity

Microsystem: Individual and family factors. Among low-income Latino women, several individual and family factors influence their level of food insecurity. These factors include: (a) lack of basic education, (b) lack of life skills, (c) poverty, (d) unemployment, (e) health problems, (f) health care coverage, (g) lack of knowledge of community resources, (h) legal residence status of children, and (i) aspirations for homeownership (Bronte-Tinken, Zaslow, Capps, Horowitz, &

McNamara, 2007; Casey et al., 2004; Sano, Garasky, Greder, Cook, & Browder, 2010; Stuff, Casey, Szeto, Gossett, Robbins, Simpson, Connell, & Bogle, 2004; Weigel, Armijos, Hall, Ramirez, & Orozco, 2007; Weinreb et al., 2002). Research has linked food insecurity and health problems among children as resulting from an indirect association between food insecurity and high levels of parental depression (Bronte-Tinken et al., 2007). In addition, parental depression is also associated with lower levels of positive parenting practices (Bronte-Tinken et al., 2007).

Mesosystem: Social network factors. Among low-income rural women, including Latino women, social network factors that influenced food insecurity levels include social support such as financial and practical support given by friends and family members (Sano et al., 2010; Seiling, 2006). This research, using a sample from the Rural Families Speaks data set, shows the complexity of social support on food security. Sano and colleagues (2010) found that food insecure households seemed to have very strong familial bonds with extended family members who tended to need financial support from the immigrant families, leaving these immigrant households without the needed resources to provide for their food needs. In contrast, members of consistently food secure households had extended family members who did not receive financial support from the families, leaving more resources for their own household's food purchases. In addition, Seiling (2006) found that food security status differed significantly by the size of social support network. When a mother indicated that she could rely on ten or more individuals to provide support to her, her household was less likely to be food insecure.

Exosystem: Community factors. Among low-income Latino women, several community factors influenced their level of food insecurity. These factors included: (a) social support agencies and (b) local economy. Social support agencies available to low income families include SNAP, WIC, school breakfast/lunch programs, Medicaid, food banks, and food and clothing banks from community action agencies. A family's use of such agencies has been found to depend not only on need but also on past experiences and cultural norms regarding self-sufficiency and use of assistance.

For example, Latino immigrants whose household's food security level varied over time tended to briefly use assistance such as SNAP, WIC, school breakfast/lunch programs, and Medicaid as well as food pantries and community action agencies (Sano et al., 2010). In addition to cultural norms of self-sufficiency, Sano et al. (2010) found the use of agencies was also influenced by how welcoming the agencies were to the families.

Macrosystem: Larger cultural contextual factors. Among low-income Latino women, larger cultural contextual factors of food insecurity include: (a) governmental social and immigration policies and (b) cultural values of the Latino women. Governmental policies establish eligibility for programs, thereby influencing which families have access to programs. According to the National Council of La Raza (2006), only 51% of eligible Latinos are accessing SNAP, the nation's leading defense against hunger. This participation rate could be related to the immigration status of household members in Latino immigrant families. Parents who lack legal documentation tend to have fluctuations in their employment and consequently in their level of food security. Often the fear of being caught and subsequently deported prevents many immigrants from reaching out to community resources even if members of their families are eligible to receive services, for example, children who were born in the United States. .

Predominant cultural values of Latino immigrant families may also influence food insecurity. Quandt, Shoaf, Tapia, Hernández-Pelletier, Clark, and Arcury (2006) found that Latino immigrants who resided in North Carolina consider themselves to be members of bi-national communities, meaning they view themselves as still being a member of their native community when living in the United States. Because they consider themselves still part of their native community, many immigrants try to conceal from their extended family members just how unstable their new circumstances are in the United States because they are concerned that the humiliation of being unable to provide for their household's food needs will reach their native communities.

Purpose of This Dissertation

The purpose of this dissertation was to better understand depression among rural Latino women. Information on depression among rural Latino women is scarce. Most studies that examine depression do not target rural women. Furthermore, depression among Latino women who live in rural settings is rarely studied. This dissertation includes two longitudinal studies that examine depression among rural Latino women, one using quantitative methodology and another using predominantly qualitative methodology. This approach added depth to the data and allowed for analysis of trends that may not be clearly evident from either quantitative or qualitative methodology alone or data from a single year. A greater understanding of how depression affects rural Latino women was gained by posing the following research questions:

1. What is the relationship between depressive symptoms among rural Latino women and food insecurity?
2. Why do some rural low income Latino women have consistently low depressive symptoms while others have high depressive symptoms?

Rural Families Speak Project

The Rural Families Speak study (RFS) was a multi-state longitudinal study that tracked the well-being and functioning of low income rural families in the context of welfare reform. An interdisciplinary team of family scientists, family economists, child development specialists, nutritional scientists, rural sociologists, and psychologists developed the mixed method study design, simultaneously collecting both quantitative and qualitative individual- and family-level data. The project personnel collected three waves of data between 1999 to 2007 in 17 states (Bauer, 2004; Bauer & Katras, 2007).

The longitudinal RFS data include three panels of family level data, each consisting of a different grouping of states. For all three waves of data collection, Panel 1 consisted of 14 states, Panel 2 consisted of two additional states, and Panel 3 consisted of one additional state. For each

panel, the data collection periods (Waves 1, 2, and 3) used the same interview protocol that included a primary set of questions although states were allowed to include additional questions of interest to their state (Bauer, 2004; Bauer & Katras, 2007) (see Table 1).

The RFS study consists of low-income rural mothers. Mothers who met the study criteria were recruited into the study by professionals working in organizations that served low-income families including Head Start, WIC, and Community Action Programs (Bauer, 2004; Bauer & Katras, 2007).

Table 1
States in Each Panel per Wave

Wave 1			Wave 2			Wave 3		
Panel 1 (n = 355)	Panel 2 (n = 58)	Panel 3 (n = 31)	Panel 1 (n = 355)	Panel 2 (n = 58)	Panel 3 (n = 31)	Panel 1 (n = 355)	Panel 2 (n = 58)	Panel 3 (n = 31)
CA, IN, LA, MA, MD, MI, MN, NE, NH, NY, OR, KY	OH, WV	IA	CA, IN, LA, MA, MD, MI, MN, NE, NH, NY, OR, KY	OH, WV	IA	CA, IN, LA, MA, MD, MI, MN, NE, NH, NY, OR, KY	OH, WV	IA

The RFS consisted of mothers who (a) had at least one child under 13 years of age living in their household, (b) had household incomes at 200% of the federal poverty line or below, and (c) lived in identified rural counties that were classified as a Rural-Urban Continuum Codes of 6, 7, or 8 using the county classification system of the U. S. Department of Agriculture (Butler & Beale, 1994). Codes 6 and 7 denote non-metropolitan counties that have an urban population between 2,500 and 19,000. Code 8 counties include no town of more than 2,500. As reported in *Rural Prosperity: A Longitudinal Study of Rural Communities and Rural Low-income Families* (Bauer & Katras, 2007), each state recruited mothers who represented the racial and ethnic diversity of its low-income rural

population with four states (Michigan, Oregon, California, and Iowa) over-sampling Latino mothers. Three two hour in-depth face-to-face interviews were conducted with each mother in a location that was convenient and comfortable for her. Locations included mothers' homes, local Cooperative Extension offices, and community libraries (Bauer, 2004; Bauer & Katras, 2007).

A bilingual Mexican graduate student who studied linguistic studies and qualitative research methodology at a midwestern land grant university translated the interview protocol and survey instruments from English to Spanish. A community-based professional employed by a university who worked with Spanish-speaking families and who was Mexican reviewed the translations to ensure that the translations would make sense to the mothers. Bilingual, bicultural project personnel were hired and trained to interview participants. The training included information on the following: (a) building trust and rapport with participants, (b) using the RFS interview protocol, and (c) asking open-ended questions to elicit rich and detailed responses. The interviews were audio taped and transcribed verbatim. The interviews that were conducted in Spanish were then translated into English by bilingual, bicultural Latino graduate students.

The audio tapes of each interview (one interview in each wave for a total of three interviews per study participant) were transcribed verbatim by the Rural Families Speak research team. Using the qualitative data analysis process of constant comparative analysis, the transcripts were read multiple times by members of the research team to identify emerging themes (or content areas) from the data. Eighteen themes emerged from the data. The transcripts were then systematically coded using these 18 themes. The data analysis program, MAXQDA, was used to code transcripts according to these themes (Bauer, 2004; Bauer & Katras, 2007).

The quantitative data sets consisted of responses to closed ended interview questions as well as to specific survey measures. Survey measures included the following: (a) the Center for Epidemiologic Studies Depression Scale (Radloff, 1977), (b) the USDA Core Food Security Module (Hamilton, Cook, Thompson, Buron, Frongillo, Olson, & Wehler, 1997), (c) Knowledge of

Community Resources (Richards, 1998), and (d) Life Skills Assessment (Richards, 1998). The data files were organized by waves and panels (see Table 2). Data from the interviews and surveys were quantified as appropriate and entered into SPSS, a statistical software program (Bauer, 2004; Bauer & Katras, 2007).

Measures

The Center for Epidemiologic Studies Depression Scale (CES-D). Maternal depressive symptoms were assessed with the CES-D, a 20-item, self-report or interviewer-administered instrument used to capture the level of depressive symptoms during the previous week (Radloff, 1977). Examples of statements include “I was bothered by things that usually don’t bother me” and “I talked less than usual” with four items reversed coded. Responses to items on the CES-D use a 4-point Likert scale with “0” representing rarely or none of the time, less than 1 day/week, “1” representing some or a little of the time, 1-2 days/week, “2” representing occasionally or a moderate amount of time, 3-4 days/week, “3” representing most or all of the time, 5-7 days/week.

Scores for CES-D range from 0 to 60 with higher scores indicating greater severity of depressive symptoms. Radloff’s (1977) research using the CES-D demonstrated that it is a psychometrically sound instrument; reliability for the CES-D is $\alpha = 0.85$ in the general population and $\alpha = 0.90$ in psychiatric populations. In addition, the construct validity of the CES-D scale has been demonstrated on a community prevalence study in which the prevalence rate of clinical depression derived by a CES-D cut point set at 16 was similar to other self-report depression scales (Weissman & Myers, 1978). Furthermore, factor analysis has shown that the factor structure of the scale is consistent across racial groups (Roberts, 1980).

USDA Core Food Security Module (CFSM). Food security status was measured by the 18-item U.S. Household Food Security Module with a 12-month reference period (Hamilton et al., 1997). Examples of questions include: (a) In the last 12 months, since last (name of current month), did you (or other adults in your household) ever cut the size of your meals or skip meals

Table 2

Summary of Means, Standard Deviations, Ranges, Skewness, Kurtosis, and Standard Errors for Scores on the CES-D, CFSM, KCR, and LS for Each Wave Examined

Variable	Wave 1				
	Mean	SD	Range	Skewness (SE)	Kurtosis (SE)
CES-D	17.65	11.55	53.00	0.85 (.11)	.37 (.22)
CFSM	3.48	3.78	18.00	1.1 (.11)	.69 (.22)
KCR	16.50	4.93	22.00	-.89 (.12)	.07 (.24)
LS	18.72	4.38	23.00	-1.05 (.13)	1.06 (.26)
	Wave 2				
	Mean	SD	Range	Skewness (SE)	Kurtosis (SE)
CES-D	14.56	11.16	56.00	1.17 (.14)	1.02 (.27)
CFSM	2.95	3.51	15.00	1.26 (.14)	.88 (.27)
	Wave 3				
	Mean	SD	Range	Skewness (SE)	Kurtosis (SE)
CES-D	15.43	12.22	54.00	.98 (.14)	.37 (.27)
CFSM	2.41	3.22	17.00	1.58 (.13)	2.49 (.27)

because there wasn't enough money for food? (b) In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food? and (c) In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food? The food security score was calculated by summing the 18 items with possible scores ranging from 0 to 18, with the higher scores indicating greater food insecurity.

Households can be categorized as food secure and food insecure using the CFSM.

Households are categorized as food secure if they provide two or fewer affirmative responses. When a household reports no indications of food-access problems or limitations, the household is described as having high food security. If the household reports one or two affirmative responses, the household members are described as having marginal food security. Typically these members have anxiety over having enough food in the house but report little, if any, indication of changes in diets or food intake. Households are categorized as food insecure if they provided three or more affirmative

responses. When a household reports having a diet that consists of reduced quality, variety, or desirability with little, if any, indication of changes in food intake, the household is described as having low food security. Finally, if the household reports both disrupted eating patterns and reduced food intake, then the household is described as having very low food security (Bickel, Nord, Price, Hamilton, & Cook., 2000; Nord & Coleman-Jensen, 2009).

In this study, food insecurity was used as a continuous variable representing intensity (Gundersen, Weinreb, Wehler, & Hosmer, 2003). The scale has good validity and reliability, with a reliability coefficient of $\alpha = 0.81$ for households with children (Hamilton, Cook, Thompson, Buron, Frongillo, Olson, & Wehler, 1997). The CFSM is similarly reliable for populations of racial and ethnic minorities (Frongillo, 1999).

Knowledge of community resource (KCR). Knowledge of community resources was measured by using the 22-item Knowledge of Community Resources Index (Richards, 1998). This index asks mothers to indicate if they know how to find specific services within the community such as job training and child care, asking questions like “Do you know how to find a mental health counselor?” and “Do you know how to apply for WIC?” The knowledge of community resources score was calculated by summing the number of items with an affirmative response. A higher score indicates a greater knowledge of community resources which is an indicator of resource management skills and support available to families. Since this measure is an index rather than a scale, it is not assumed that the frequency of knowledge of community resources should be correlated with the frequency of other items within the same index. Therefore, reliability of this measure is not applicable (Richards, 1998).

Life skill (LS). Life skills were measured by using the 25-item Life Skills Assessment (Richards, 1998). This index asks mothers to indicate which life skills they possess such as “Do you know how to stretch your groceries to the end of the month?” and “Do you know how to create a personal support system?” The life skills score was calculated by summing the items with an

affirmative response. A higher score indicates that the participant has more life skills. Since this measure is an index rather than a scale, it is not assumed that the frequency of life skills should be correlated with the frequency of other items within the same index. Therefore, reliability of this measure is not applicable (Richards, 1998).

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CHAPTER 2: FOOD INSECURITY AND MATERNAL DEPRESSION AMONG LATINA,
AFRICAN AMERICAN, AND CAUCASIAN LOW INCOME MOTHERS IN RURAL AMERICA:
A LATENT GROWTH-CURVE ANALYSIS

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Abstract

This study examined depression among rural Latina, African American, and Caucasian women using data from a multi-state longitudinal project. Latent growth curve modeling (LGC) was used to test for influences of ethnicity on the relationship between food insecurity scores and depressive symptoms. Ethnicity was found to directly and indirectly influence depressive symptoms. Latinas were most food insecure, and African Americans were the least food insecure. African Americans experienced higher rates of food insecurity over time than Latinas and Caucasians. In addition, Latinas exhibited lower levels of depressive symptoms at all three interviews.

Keywords: food insecurity, depressive symptoms, latent growth curve modeling

Introduction

According to the U.S. Census Bureau (2006), Latino individuals are the largest minority group in the nation and are projected to become the predominant ethnic group by the year 2050 with a projected population of more than 102 million. Furthermore, in pockets of rural America, the Latino population is the fastest growing demographic, reversing the gradual population decline (U.S. Census Bureau, 2006). Despite these growing numbers, relatively little attention has been focused on the depressive symptoms of Latino immigrants residing in rural America.

Among Latina, Huang, Wong, Ronzio, and Yu (2007) found an approximate depressive symptomatology rate of 38%. However, Latinos, and especially Latino immigrants, have very low rates of accessing mental health services (Martínez Pincay & Guarnaccia, 2007). Research indicates that Latina experience similar barriers to positive mental health as non-Latina, e.g, affordability,

availability, accessibility, and acceptability (Logan, Stevenson, Evans, & Leukefeld, 2004). However, Latina tend to face other challenges as well, such as immigration and acculturation experiences, discrimination, feelings of isolation, lack of health insurance, and low educational attainments (Cutrona, Wallace, & Wesner, 2006; Hall & Farkas, 2008; Lazear, Pires, Issacs, Chaulk, & Huang, 2008). The need for increased understanding of depression among Latina can be used to develop interventions to prevent depression and to promote well-being among all Latinas.

While food insecurity has been associated with depression among women (Laraia, Siega-Riz, Gundersen, & Dole, 2006; Huddleston-Casas, Charnigo, & Simmons, 2009), relatively little attention has been focused on the needs of Latina immigrants residing in rural America. According to Nord and Coleman-Jensen (2009), the rate of food insecurity among Latino households is nearly double the national rate, 26.7% and 14.6%, respectively. Food insecurity among rural Latino families tends to be magnified by environmental factors such as poor quality housing and community isolation (Kandel & Newman, 2004; Sano, Garasky, Greder, Cook, & Browder, 2010). These environmental factors, in conjunction with diminished social support, can lead to increased levels of food insecurity and increased stress levels which exacerbate depressive symptoms in Latino immigrants.

Theoretical Model

The association between food insecurity and depression has been well documented (Gundersen, Weinreb, Wehler, & Hosmer, 2003; Heflin, Siefert, Corcoran, & Williams, 2005; Heflin & Ziliak, 2008; Wehler, Weinreb, Huntington, Scott, Hosmer, Fletcher, Goldberg, & Gundersen, 2004). Food insecurity has been hypothesized to influence depression. Alternatively, depression has been hypothesized to influence food insecurity. In evaluating this connection between food insecurity and depression, however, attention must be paid to the continuous changes in these variables over time in order to best understand the influences of one variable on the other.

Although change in connections between food insecurity and depression has often been inferred from associations between initial and final outcomes, most of the previous studies have not

addressed the continuous nature of changes and instead yield a static view of outcome as a series of discrete snapshots linked by incremental changes (Karney & Bradbury, 1995). In this study, changes in food insecurity and depressive symptoms are considered to be continuous processes. In so doing, the questions that deal with individual continuous changes will be confronted. Many researchers have maintained that individual time path, also called trajectories, are the appropriate focus for the analysis of change (Lorenz, Conger, Montague, & Wickrama, 1993; McLeod & Shanahan, 1996; Wickrama, Beiser, & Kaspar, 2006). Individual trajectories of food insecurity and depressive symptoms will be described while accounting for the developments that underlie these trajectories (Karney & Bradbury, 1995).

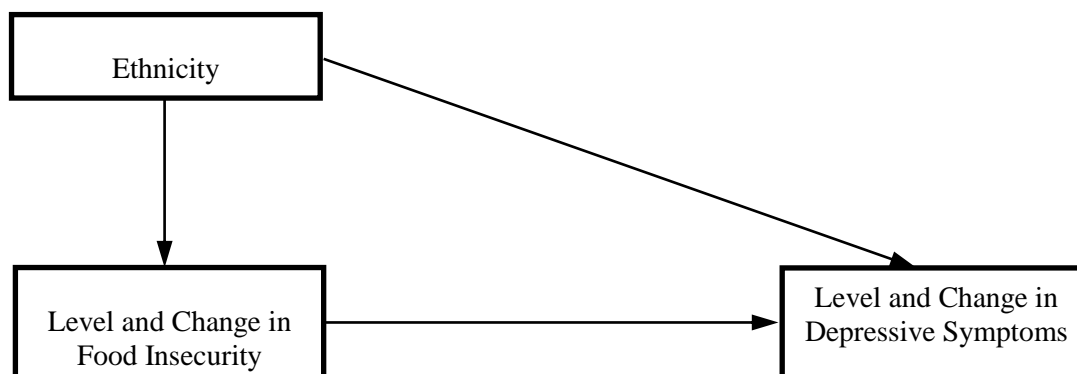
Figure 1 outlines the theoretical model. The basic line of reasoning is that ethnicity and food insecurity directly affect depressive symptoms and ethnicity also indirectly influences the impact of food insecurity on depressive symptoms. Using panel data, I examined how levels of food insecurity correspond with levels of depressive symptoms. More importantly, I examined how changes in trajectories of depressive symptoms are predicted by trajectories of food insecurity including indirect effects of ethnicity. In this way, I examined the following questions related to individual trajectories of food insecurity and depressive symptoms and ethnicity:

1. Does the initial level of food insecurity influence the initial level of depressive symptoms?
2. Does the rate of change of food insecurity influence the rate of change in depressive symptoms?
3. Does ethnicity directly influence the initial level and rate of change of food insecurity?
4. Does ethnicity directly influence the initial level and rate in change of depressive symptoms?
5. Does ethnicity indirectly influence depressive symptoms through food insecurity ?

In this study, I hypothesized that the level of food insecurity predicts the level of depressive symptoms (see Figure 1). Thus, I expect individual trajectories of food insecurity and depressive symptoms to covary. I also hypothesize that ethnicity directly and indirectly influences depressive

symptoms (see Figure 1). The mechanisms by which this model is expected to operate are outlined below.

Figure 1. *The Theoretical Model*



Traditional approaches to analyzing change, such as regression models and mean comparisons, do not preserve the continuity of change. Regression models examine change over time by using only two measurements of an outcome variable which incorporates little information about change over time (Rogosa, Brand, & Zimowski, 1982). This approach is insensitive to individual differences in change over time since it estimates inter-individual change between measurement time points (Wickrama et al., 2006). Furthermore, traditional approaches are not sensitive enough to capture individual difference of the intensity and the amount of growth or decline in symptoms over time (Karney & Bradbury, 1995), nor are they flexible enough to take into account time-varying predictors while preserving their continuous nature.

In this study, I modeled the trajectory of change across an individual's measurement points with latent growth curves. The latent growth curve (LGC) technique within a structural equation modeling (SEM) framework provides an estimation of individual change parameters as well as their differences across individuals. The LGC also takes into account both means and variances to estimate underlying time-related factors of growth and decline. These growth factors are sensitive to

inter-individual differences in intra-individual change (Lorenz et al., 1993; McLeod & Shanahan, 1996; Wickrama et al., 2006).

Purposes of the Present Study

Previous research findings (see Introduction) suggest that Latina immigrants may be at risk for the development of increased depressive symptoms. This present study has two purposes related to increasing understanding of how and/or if ethnicity interacts with food insecurity and depressive symptoms. The first purpose of this study was to examine trajectories of food insecurity with trajectories of depressive symptoms. High levels of overall food insecurity were expected to covary with high levels of depressive symptoms. The second purpose was to examine how ethnicity influences the trajectories of food insecurity and the trajectories of depressive symptoms.

Methods

This study employed latent growth curve analysis in order to address the continuity of food insecurity and depressive symptoms rather than as a series of discrete snapshots linked by incremental changes (Karney & Bradbury, 1995). Changes in food insecurity and depression are considered continuous processes. By using latent growth curve analysis, I addressed the questions that deal with individual continuous change. Many researchers have asserted that individual time paths, also called trajectories, are the appropriate focus for the analysis of change (Lorenz et al., 1993; McLeod & Shanahan, 1996; Wickrama et al., 2006).

Participants

This study sample of 476 rural women with subsamples of 119 Latina mothers, 320 Caucasian mothers, and 37 African American mothers came from the multi-state Rural Families Speak (RFS) research project and AMOS imputed missing data (SPSS, 2010). RFS assessed the circumstances of 523 rural low-income families in 17 states (California, Indiana, Iowa, Kentucky, Louisiana, Massachusetts, Maryland, Michigan, Minnesota, Nebraska, New Hampshire, New York, Ohio, Oregon, South Dakota, West Virginia, Wyoming) in the context of the 1996 welfare reforms

(Bauer, 2004). However, in this study, only Latina, Caucasian, and African American mothers were selected.

Latina populations of RFS were oversampled in California, Michigan, Oregon, and Iowa. Substantial diversity existed among Latino families in the project. The majority of those women in California were either first-generation or second-generation immigrants, while the women in Michigan were typically members of migrant households. The Latino families in both Oregon and Iowa were semi-settled. In Oregon, agricultural and construction industries attracted Latino laborers, while in Iowa the major industry for Latino workers was meat packing companies.

Purposive sampling was used in this study to identify mothers age 18 and older with at least one child 12 years old or younger and whose family incomes were at or below 200% of the federal poverty line at the baseline interviews. Mothers were recruited in person and by phone using personnel in community organizations and services such as community outreach offices, County Cooperative Extension Services, Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and Head Start.

In this study at Wave 1, mothers' ages ranged from 18 to 59 years with a mean of 30 years ($SD = 7.441$). The youngest child's age ranged from newborn to 12 years with a mean age of 3.342 years ($SD = 2.976$). The number of children per family ranged from 1 to 10 children with a mean number of 2.350 children ($SD = 1.333$). The majority of the mothers (61%) were married or living with a partner, and 39% of the women headed single-mother households. The mothers were almost equally split between employed and unemployed with 48% and 52%, respectively. The majority (66%) of mothers had a high school diploma or higher and 13% had only an eighth grade education or less. The median combined annual income of all household members was \$15,474, ranging from no income to \$57,336; 64% of the households' incomes fell below the U.S. federal poverty threshold for their family size (Poverty, 2009), while 36% of the families' incomes were above the poverty threshold (see Table 1).

Table 1
Demographics by Ethnic Group

Variable	Ethnicity		
	Latina (n = 119)	Caucasian (n = 320)	African American (n = 37)
Mean Age	32	30	26
Married (%)	89%	55%	24%
Mean # of Children	2.91	2.16	2.22
Mean # of Total Family Members	5.62	4.00	4.51
Employed (%)	50%	48%	51%
High School degree or higher (%)	37%	76%	65%
Mean Annual Income	\$21,126	\$14,074	\$9,565
Below Poverty Threshold (%)	53%	64%	81%

Measures

Maternal depressive symptoms. The Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) was used to assess depressive symptoms. CES-D is a 20-item, self-report or interviewer-administered instrument used to capture the level of depressive symptoms during the previous week. Examples of statements include “I was bothered by things that usually don’t bother me” and “I talked less than usual.” Responses to items on the CES-D use a 4-point Likert scale with “0” representing rarely or none of the time, less than 1 day/week; “1” representing some or a little of the time, 1-2 days/week; “2” representing occasionally or a moderate amount of time, 3-4 days/week; and “3” representing most or all of the time, 5-7 days/week.

Scores for CES-D range from 0 to 60 with higher scores indicating greater severity of depressive symptoms. Radloff’s (1977) research using the CES-D demonstrated that it is a psychometrically sound instrument; reliability for the CES-D is $\alpha = 0.85$ in the general population and $\alpha = 0.90$ in psychiatric populations. In addition, the construct validity of the CES-D scale has been demonstrated on a community prevalence study in which the prevalence rate of clinical depression derived by a CES-D cut point set at 16 was similar to other self-report depression scales

(Weissman & Myers, 1978). In this study, however, a continuous variable was used to represent the intensity of depressive symptoms (Chen, Subramanian, Acevedo-Garcia, & Kawachi, 2005).

Furthermore, factor analysis has shown that the factor structure of the scale is consistent across racial groups (Roberts, 1980). In this study, reliability for the CES-D was $\alpha = 0.897$.

USDA Core Food Security Module (CFSM). Food security status was measured by the 18-item U.S. Household Food Security Module with a 12-month reference period (Hamilton, Cook, Thompson, Buron, Frongillo, Olson, & Wehler, 1997). Examples of questions include: (a) In the last 12 months, since last (name of current month), did you (or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food? (b) In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food? and (c) In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food? The food security score is indicated by a continuum of scores ranging from zero to ten. A household's score depends on the number of increasingly severe indications of food insecurity that the household has experienced, as indicated by affirmative responses to the increasingly severe sequence of survey questions. Since the scale measures the severity of food insecurity, the condition of fully secure represents the absence of the measured condition and is assigned a value of 0 (Bickel, Nord, Price, Hamilton, & Cook, 2000; Nord & Coleman-Jensen, 2009).

Households can be categorized as food secure or food insecure with the former having subsets of high food security and marginal food security and the latter having subsets of low food security and very low food security. Households are categorized as food secure if they provide two or fewer affirmative responses. When a household reports no indications of food-access problems or limitations, the household is described as having high food security. If the household reports one or two affirmative responses, the household members are described as having marginal food security. Typically these members have anxiety over having enough food in the house but report little, if any,

indication of changes in diets or food intake. Households are categorized as food insecure if they provided three or more affirmative responses. When a household reports having a diet that consists of reduced quality, variety, or desirability with little, if any, indication of changes in food intake, the household is described as having low food security. Finally, if the household reports both disrupted eating patterns and reduced food intake, then the household is described as having very low food security (see Table 2).

Table 2

Labels and Descriptions of Food Security and Insecurity

General categories	Labels	Description of conditions in the household
Food security	High food security	Households show no evidence of food insecurity. No affirmative responses given.
	Marginal food security	Evidence of food insecurity is shown in concerns about adequacy of the food supply and food management. Little, if any, reduction in household members' food intake is reported. A score of 1 or 2.
Food insecurity	Low food security	Evidence of food insecurity is shown in reports of reduced quality, variety, or desirability of diet. Little, if any, indication of reduced food intake for children are not reported at this stage for children. A score of 3 to 7.
	Very low food security	Evidence of food insecurity is shown in reports of multiple indications of disrupted eating patterns and reduced food intake. At this level, food intake has been reduced indicating that adults and children have experienced hunger. A score of 8 or higher.

In this study, a continuous variable was used to represent the intensity of food insecurity (Carmichael, Yang, Herring, Abrams, & Shaw, 2007). The scale has good validity and reliability, with a reliability coefficient of $\alpha = 0.81$ for households with children (Hamilton et al., 1997). The

CFSM is reliable for populations of racial and ethnic minorities (Frongillo, 1999). In this study, the CFSM has a reliability coefficient of $\alpha = .794$.

Ethnicity. Finally, one sociodemographic variable, ethnicity, was also included at wave 1. For this study, ethnicity included only three categories (Latina, Caucasian, and African American), since mothers of other ethnicities were excluded. In the latent growth curve modeling, the Caucasian group was used as the comparison group. Therefore, their trajectories were the point of comparison.

Latent growth curve (LGC) modeling

LGC was used to estimate individual trajectories and to investigate their correlates. LGC estimation starts by describing change over time for each person by constructing intra-individual trajectories (Wickrama, Lorenz, & Conger, 1997; Willett & Sayer, 1994). The process of estimating growth curves for each person p ($p = 1, 2, \dots, n$) is done by linking the observed scores at each wave of measurements (y_{t1} , y_{t2} , and y_{t3}) to time (t_1 , t_2 , and t_3) using 2 parameters, an intercept (level) π_0 and a slope (rate of change) π_1 as expressed in these equations:

$$\begin{aligned} y_{1p} &= 1 * \pi_{0p} + t_1 * \pi_{1p} + \varepsilon_{11} \\ y_{2p} &= 1 * \pi_{0p} + t_2 * \pi_{1p} + \varepsilon_{22} \\ y_{3p} &= 1 * \pi_{0p} + t_3 * \pi_{1p} + \varepsilon_{33} \end{aligned}$$

In the above equations ε_{11} , ε_{22} , and ε_{33} are the residuals at each point in time and are assumed to be normally distributed with 0 means.

These three equations are consistent with a SEM model with latent and manifest measurements. In the structural equation framework, π_0 and π_1 can be considered as two latent variables that are measured by three manifest indicators y_{t1} , y_{t2} , and y_{t3} . The coefficients of π_0 in three equations are equal to factor loadings of three indicators (measurements) for the “level” latent variable and are always equal to 1. The coefficients of π_1 for three equations (t_1 , t_2 , and t_3) are equal to factor loadings of three measurements for the “rate of change” latent variables. These factor loadings are set to represent the corresponding wave of measurements. For example, if t_1 , t_2 , and t_3 are 0, 1, and 2 respectively, change would be a linear increase across 3 time points and the level

(intercept) is defined by measurement of y at the first time point, the point at which factor loading is equal to 0 (Wickrama et al., 2006).

Individual trajectories (level and rate of change) are expected to vary from individual to individual. For a sample of n individuals, there would be as many as n different levels of measurements (depressive symptoms) and as many as n different rates of change over time. Although each individual trajectory varies in level and rate of change, these individual trajectories can be merged so that for the whole sample, an average level (mean of π_0) with a variance and an average rate of change (mean of π_1) (which also has a variance) exist (Wickrama et al., 2006). The mean and variance of the level parameter identify the overall average of the individual-specific levels and variability of levels (dispersion) across individuals. Furthermore, the mean for the rate of change describes the average overall change in symptoms of individuals over time while the population variance for the change parameter reflects differences in the rate of change across individuals. Significant variances in the growth curve parameters indicate the heterogeneity of the individual-specific trajectory population (Wickrama et al., 2006).

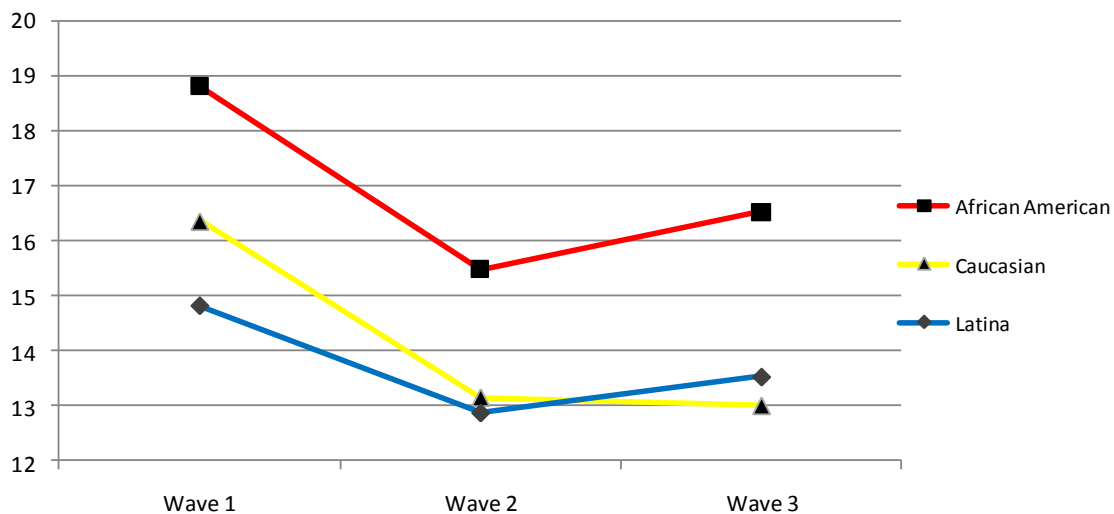
In addition to the simple description of change, growth curve modeling allows us to explain systematic inter-individual differences in both the level and the rate of change for measurements (depressive symptoms). When the change parameter (e.g., rate of change in depressive symptoms) covaries significantly with a predictor variable (e.g., ethnicity), differences in rate of change in depressive symptoms across individuals are said to be systematic (Willet & Sayer, 1994). Therefore, the depressive symptom growth parameters of individuals (π_{0p} or π_{1p}) can be represented by the following equations using ethnicity as a predictor variable:

1. For level of p^{th} individual: $\pi_{0p} = \alpha_{\pi_{0p}} + \beta_1(\text{ethnicity}) + \zeta_1$
2. For rate of change of p^{th} individual: $\pi_{1p} = \beta_{\pi_{1p}} + \zeta_2(\text{ethnicity}) + \zeta_2$

In the above terms, $\alpha_{\pi_{0p}}$ and $\alpha_{\pi_{1p}}$ are intercepts of the prediction equations, β_1 and β_2 are path coefficients connecting change parameters of depressive symptoms and predictor variables, and ζ_1

and ζ_2 are disturbances (Wickrama et al., 2006). Figure 2 provides the average level of depressive symptoms reported by ethnicity in each of the three subgroups (Latina, African American, and Caucasian) over time. These plots show that the subgroups had similar trajectories, although they differed significantly in their initial levels and corresponding changes over time (see Figure 3). Similar trajectories of depressive symptoms have been found among other studies of depressive symptoms among adults (Ge, Lorenz, Conger, Elder, & Simmons, 1994; Wickrama, Noh, & Elder, 2010).

Figure 2. Change in Depressive Symptoms for Latina, Caucasian, and African American Groups of Rural, Low Income Mothers



Furthermore, if the predictor variable is time-varying, growth curve trajectories can also be estimated for the predictor variables. Then the growth parameters of the predictor variable (covariate) can be used as predictors. This results in two possible equations predicting symptom growth parameters for the p^{th} individual which are as follows:

$$(\text{level of symptoms})_p = \alpha_{\pi 0p} + \beta_1(\text{level of food insecurity})_p + \zeta_1$$

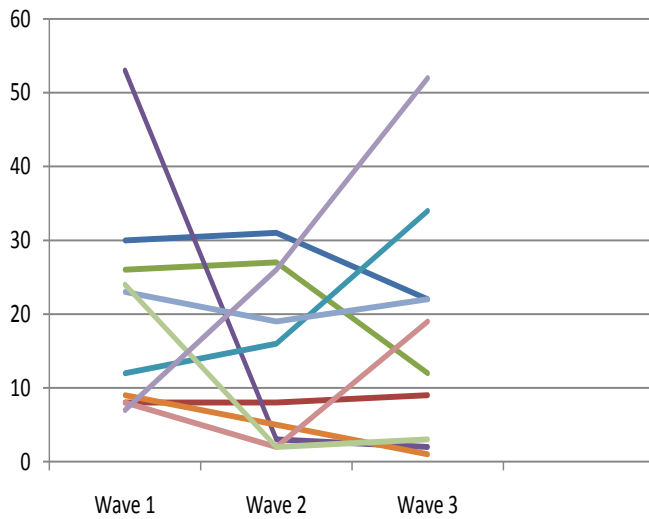
and

$$(\text{rate of change in symptoms})_p = \alpha_{\pi 1p} + \beta_2(\text{rate of change in food insecurity})_p + \zeta_2$$

or

$$(\text{rate of change in symptoms})_p = \alpha_{\pi 1p} + \beta_1(\text{level of food insecurity})_p + \beta_2(\text{rate of change in food insecurity})_p + \zeta_2$$

Figure 3. An Illustration of 10 Latent Growth Curves of Y and covariate X CES-D Score



Results

Univariate growth curves were examined separately for food insecurity and depressive symptoms using methods of maximum likelihood (Snijders & Bosker, 1999) as illustrated in Figure 4. Several fit indices, such as χ^2 , CFI, and RMSEA, were used to exam the model fit (Brown, 2006; Byrne, 2010; Kline, 2005).

Univariate Growth Curves

The LGC model for food insecurity with three successive measurements (see Table 3) showed a respectable fit with the data ($\chi^2 = .377$, 1 d.f., CFI = 1.000, RMSEA = 0.000). The average initial level of food insecurity was 3.488 (S.E. = .17). The average rate of change was -.566 (S.E. = .08). That is, food insecurity had a significant developmental decline (shift in overall mean) as shown in Table 3. Thus, for food insecurity (FS), the fitted equation for average scores at $t = 1, 2$, and 3 is:

$$FS = (x + Bx) - (s + Bx)$$

$$FS = 3.488 - .566t$$

FIGURE 4. Illustration of a Latent Growth Curve with Three Successive Measurements

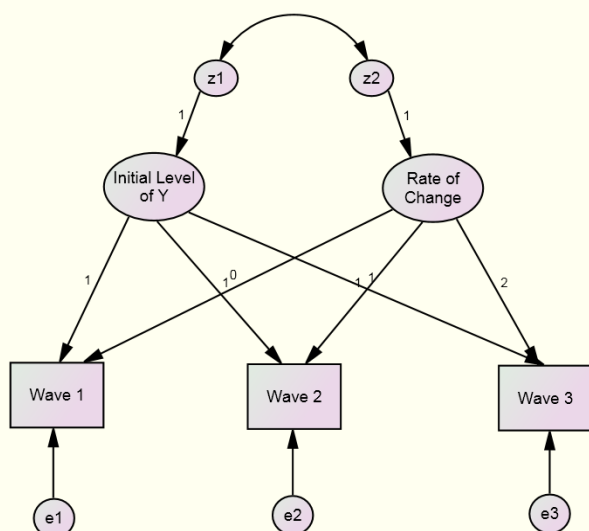


Table 3

Estimate for Univariate Latent Growth Curves of Food Insecurity and Depressive Symptoms (N = 480)*

Variables	Loadings ^a			Initial Level		Rate of Change		χ^2	RMSEA	CFI
	λ_{12}	λ_{22}	λ_{32}	Mean	Variance	Mean	Variance			
Food Insecurity	0.0	1.0	2.0	3.48*	7.83*	-0.56*	0.22	0.37	0.00	1.00
Depressive Symptoms	0.0	1.0	2.0	17.16*	71.64*	-0.95*	11.94**	11.86*	0.15	0.94

* p < .05; **p < .10

^a As illustrated in Figure 1.

The LGC model for depressive symptoms with three successive measurements (Table 3) showed a respectable fit with the data (CFI = .946). The average initial level of depressive symptoms

was 17.166 (S.E. = .52). The average rate of change was -.953 (S.E. = .34). That is, depressive symptoms had a significant developmental decline (shift in overall mean) parallel to food insecurity as shown in Table 2. Thus, for depressive symptoms (DEP), the fitted equation for average scores at $t = 1, 2,$ and 3 is:

$$\text{DEP} = 17.166 - .953t$$

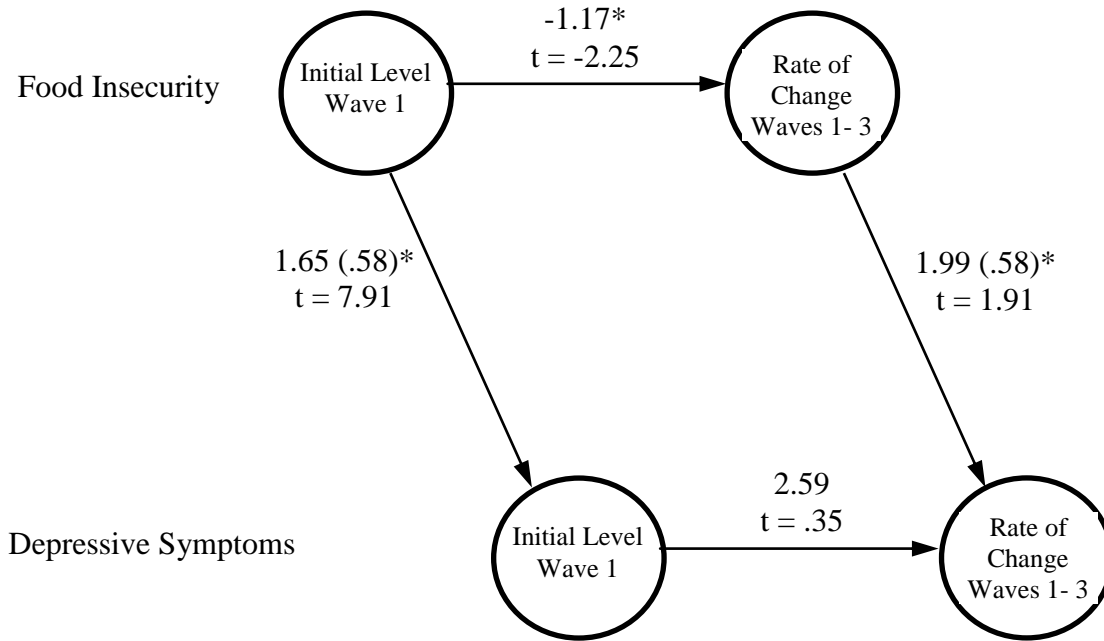
The growth curves for food insecurity and depressive symptoms both had significant variances for the intercept parameters (7.83 and 71.64, respectively) demonstrating that there were significant variabilities around their respective overall means of 3.48 and 17.16 at the initial time point (see Figures 3 and 4). The variance for the change parameter for depressive symptoms was also significant (11.94, $p = .079$), demonstrating significant inter-individual differences in intra-individual change in depressive symptoms over time. Thus, while the sample as a whole showed a significant decrease in depressive symptoms, there were also substantial differences in changes in this attribute between individuals. Some individuals experienced decreases in depressive symptoms over this period; others experienced increases in depressive symptoms.

Predicting Growth Parameters of Depressive Symptoms

The univariate growth curves for the two study variables provided a view of the initial level and rate of change for both variables. However, to test the hypothesized relationships, I estimated both LGCs simultaneously in one inclusive model. This model examined the effects of initial levels and rates of change for food insecurity trajectories on the initial levels and rates of change for depressive symptoms trajectories. The results are shown in Figure 5.

The initial level of food insecurity was significantly related to the initial level of depressive symptoms ($b = 1.576$; $t = 7.102$). That is, those who had higher starting points for food insecurity trajectories also had higher starting points for depressive symptoms trajectories. This finding demonstrates that the initial level of food insecurity directly increased the risk for depressive symptoms.

Figure 5. Unstandardized Coefficients (with standardized coefficients in parentheses) Among Initial Levels and Rates of Change of Food Insecurity and Depressive Symptoms



Note: Means and variances of initial levels and rates of changes for each latent growth curve are given in Table 2.
* $p < .05$.

Similarly, the findings also showed that change in food insecurity was significantly related to change in depressive symptoms ($b = 1.99$; $t = 1.91$). Thus, the change in food insecurity significantly contributed to change in depressive symptoms. That is, inter-individual differences in the initial level of and changes in food insecurity were significantly associated with the inter-individual differences in the initial level of and change in depressive symptoms. Such an association between individual changes gives strong evidence for the concurrent mechanisms through which food insecurity influences depressive symptoms. The analyses also showed that the initial level of food insecurity was significantly and negatively related to its rate of change ($b = -1.17$). This correlation can be interpreted as regression to the mean. The model showed a respectable fit with the data ($\chi^2 = 16.99$, 9 d.f., CFI = .98, RMSEA = .04).

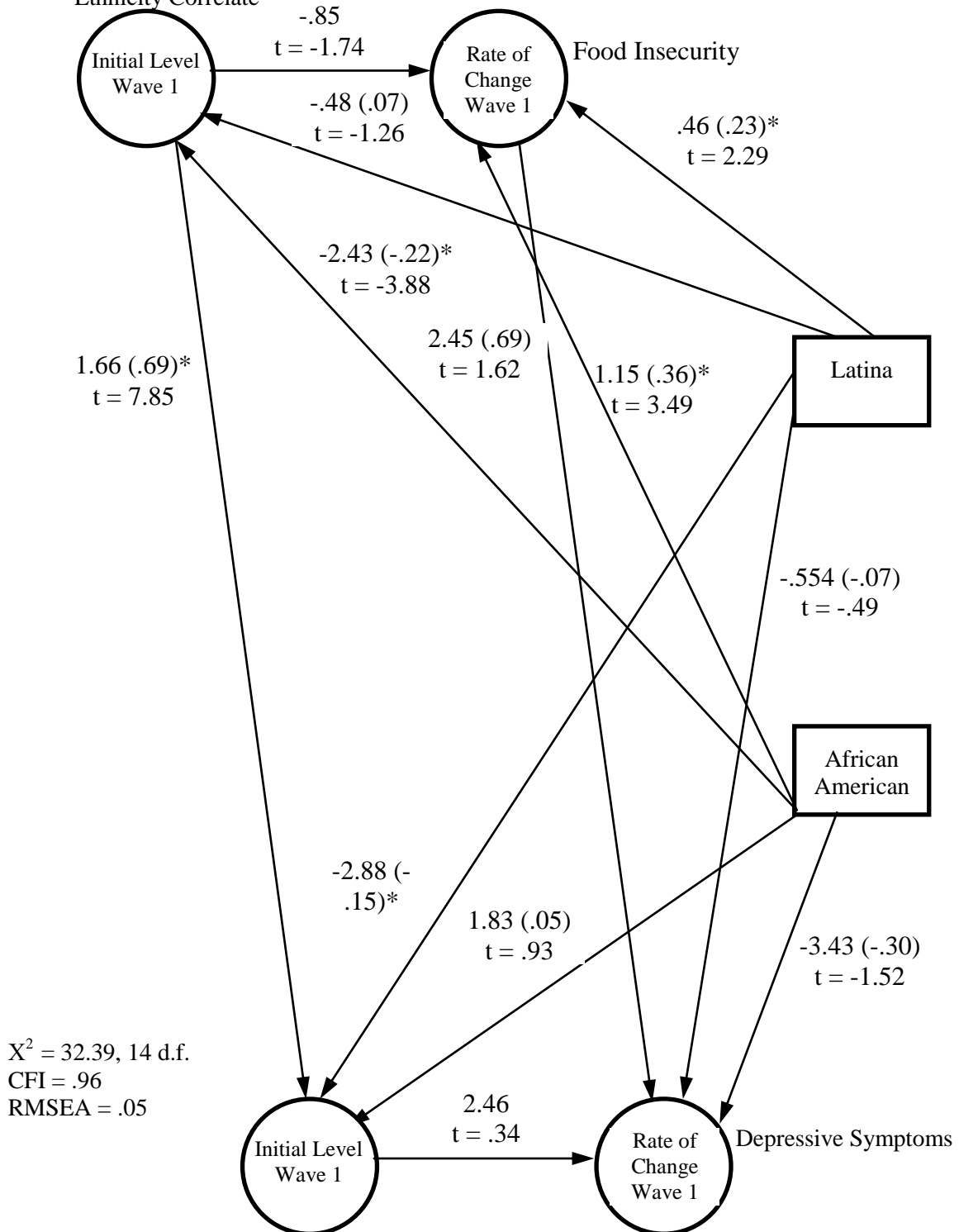
Addition of the variable, ethnicity, directly influenced the trajectories of food insecurity and depressive symptoms. Both the initial level of food insecurity and change in food insecurity were significantly related to being African American ($b = -2.430$, $t = -3.88$; $b = 1.15$, $t = 3.49$, respectively). These findings indicate that African Americans in this study initially experienced less food insecurity than Caucasians or Latinas mothers; however, over time, the food insecurity of African Americans increased. Thus, the African American mothers initially experienced less food insecurity than Caucasian and Latina mothers (see Figure 6).

Among Latinas, the initial level of food insecurity did not significantly differ from the initial level of food insecurity of Caucasians. However, the change in food insecurity was significantly and positively related to being Latina ($b = .46$, $t = 2.29$). These findings suggest that Latinas in this study became more food insecure over time than the Caucasians and had a lower rate of change in their food insecurity levels than the African Americans. However, being either African American or Latina directly influenced one's level of food insecurity over time ($b = 1.15$, $t = 3.49$; $b = .46$, $t = 2.29$, respectively).

Ethnicity also directly influenced the trajectories of depressive symptoms. Being Latina significantly and negatively influenced the initial level of depressive symptoms ($b = -2.88$, $t = -2.460$), while being Caucasian or African American did not significantly predict initial level of depressive symptoms. Thus, the Latina had, on average, a lower initial level of depressive symptoms than Caucasians did in this study. That is, in this study, being Latina directly influenced one's initial levels of depressive symptoms (see Figure 6).

After the addition of ethnicity, the initial level of food insecurity continued to be significantly related to the initial level of depressive symptoms ($b = 1.66$, $t = 7.85$). That is, those who have higher starting points for food insecurity trajectories also have higher starting points for depressive symptoms trajectories. This finding demonstrates that ethnicity indirectly influenced initial levels of depressive symptoms through initial level of food insecurity.

Figure 6. Unstandardized Coefficients (with standardized coefficients in parentheses) Among Initial Levels and Rates of Change of Food Insecurity and Depressive Symptoms with Ethnicity Correlate



Note: Means and variances of initial levels and rates of changes for each latent growth curve are given in Table 2.

* $p < .05$.

The growth curves for food insecurity and depressive symptoms continued to have significant variances for the intercept parameters (7.76 and 43.98, respectively) demonstrating, that even after accounting for ethnicity, there were significant variabilities around their respective overall means of 3.78 and 11.88 at the initial time point. Thus, while the sample as a whole showed a significant decrease in food insecurity, there were also substantial differences in changes in this attribute between individuals. Some individuals experienced decreases in food insecurity while others experienced increases over this period.

Discussion

The findings from this study help to clarify our knowledge about how the levels of and changes in food insecurity affect depressive symptoms. Latent growth curve modeling demonstrated that food insecurity decreased over the study time period (shift in overall mean), whereas depression increased. However, individual differences in changes in food insecurity were significant, showing instability of this characteristic across points of time.

The results supported my hypothesis that the initial level of food insecurity influenced the initial level of depressive symptoms. The results did not support my hypothesis that change in food insecurity negatively influenced change in depressive symptoms. The results supported my third hypothesis that ethnicity directly influenced depressive symptoms and indirectly influenced depressive symptoms through food insecurity.

Although the introduction of ethnicity did not change the pattern of these significant trajectory findings, ethnicity did directly influence initial levels of food insecurity. African Americans were most food secure, while Caucasians and Latinas were more food insecure with Latinas being the most food insecure. Similarly, ethnicity directly influenced change in food insecurity. Both Latinas and African Americans became more food insecure over time than did Caucasians, with African Americans having a greater rate of change than Latinas. Similarly, ethnicity directly influenced initial levels of depressive symptoms. Being Latina was correlated to fewer initial depressive

symptoms. In addition, Latinas exhibited lower levels of depressive symptoms at all three interviews.

Overall, results from the present study are consistent with the idea that food insecurity increases depressive symptoms, and this idea held when ethnicity was included. Therefore, ethnicity indirectly influenced depressive symptoms through food insecurity.

This study also addressed some of the methodological deficiencies in previous research on food insecurity and depressive symptoms. Latent growth curve analyses allowed me to examine changes in food insecurity and depressive symptoms, and the associations between their respective growth parameters. Because individual trajectories are the suitable focus for the analysis of change (Wickrama et al., 2008), the association between the individual growth parameters in this study provides more convincing evidence for the systematic association between food insecurity and depressive symptoms than does traditional correlation analyses.

Despite the findings of this study, several factors limit the generalizability of these results to the general, rural American population. First, the sample is not nationally representative. These analyses must be replicated with a broader cross-section of the rural population to increase their generalizability. Furthermore, even though standardized measures were used to assess food insecurity and depressive symptoms, bias is possible since self-reported data were used.

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CHAPTER 3: A LONGITUDINAL LOOK AT MATERNAL DEPRESSION
AMONG RURAL LATINO IMMIGRANT MOTHERS: A MIXED METHODS DESIGN

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Abstract

This study examined depression among rural Latino women using a concurrent triangulation mixed methods design. Data from a multi-state longitudinal project that tracked the well-being and functioning of low income rural families in the shadow of welfare reform were used. The mothers were categorized into two groups—those who maintained a consistently high level of depressive symptoms and a consistently low level of depressive symptoms. Quantitative data analyses assessed the relationship among the variables while qualitative analyses were used to provide rich descriptions of the commonalities and differences among two groups of Latino women. The quantitative data showed that the mothers who maintained low depressive symptoms throughout this longitudinal study had more children, had more life skills, knew about more community resources, utilized more social service programs, and had lower levels of food insecurity. The qualitative data highlighted the significance that one's family of origin has throughout life, specifically how a caring and supportive relationship with one's parents and siblings appears to buffer an individual from life's difficult circumstances, safeguarding one's mental health. Implications for policy and future research are considered.

Keywords: depressive symptoms, Latino women, mixed methods

Introduction

According to the U.S. Census Bureau (2006), Latinos are the largest minority group in the United States and are projected to become the predominant ethnic group by the year 2050. Furthermore, in pockets of rural America, the Latino population is the fastest growing demographic, reversing the gradual population decline in those areas (Greder, Cook, Garasky, & Ortiz, 2008;

Kandel & Cromartie, 2004; U.S. Census Bureau, 2006). Despite these growing numbers, relatively little attention has been focused on the depressive symptoms of Latino immigrants residing in rural America

Latinos experience depressive symptoms at high rates—approximately 38% of Latinos in the U.S. experience depressive symptoms (Huang, Wong, Ronzio, & Yu, 2007). However, Latinos, and especially Latino immigrants, have very low rates of mental health services (Martínez Pincay & Guarnaccia, 2007). Research indicates that Latino women experience similar challenges to positive mental health as other women experience. However, many Latino women face different challenges as well, such as immigration and acculturation experiences, discrimination, feelings of isolation, lack of health insurance, and low educational attainments (Cutrona, Wallace, & Wesnes, 2006; Hall & Farkas, 2008; Lazear, Pires, Isaacs, Chaulk, & Huang, 2008).

According to Lazear et al. (2008), Latino women who immigrate to the United States find their new lives extremely stressful. Several factors are related to this extreme stress. They include the relentless pressure to find employment, earn money, settle immigration status issues, learn a new language, and find affordable and tolerable transportation and housing while leaving some family and friends behind in their native country. These may also result in feelings of sadness and isolation.

When studying Latino women, social support, especially family support, is of special interest; social support (Cabassa, Lester, & Zayas, 2007) serves an important buffering function in mental health, and especially so for Latino women because of the importance of family values in this cultural group. Rivera (2007) found a significant relationship, mediated by family social support, between acculturation and depression. Family support is important within the Latino community with the larger, extended family establishing the stability and facilitating positive mental health outcomes (Riffe, Turner, & Rojas-Guyler, 2008). However, immigrants often enter the United States without their immediate or extended family members, leaving behind critical social support networks as they enter unfamiliar and potentially unwelcoming surroundings (Elder, Broyles, Brennan, Zúñiga de

Nuncio, & Nader, 2005; Riffe et al., 2008). Furthermore, first- and second-generation Latino immigrant women have been found to rely on family social support rather than social service agencies. These Latina immigrants perceive the social support agencies as untrustworthy since most of the agency personnel do not come from the Latino community and appear to lack cultural understanding of the Latino community (Domínguez & Lubitow, 2008).

Since Latino women tend to believe that depression is a result of difficult life events, they rarely seek mental health services immediately (Martínez Pincay & Guarnaccia, 2007). In addition, many times Latino immigrants perceive that depression occurs because of interpersonal and social factors, such as being alone or isolated from others, and may be viewed as being irrational (Cabassa et al., 2007; Martínez Pincay & Guarnaccia, 2007). Furthermore, treatment may not be immediately sought, and once it is sought, counseling is preferred to medications which are seen as addictive (Martínez Pincay & Guarnaccia, 2007). Moreover, medications carry a stigma signaling that someone is crazy and unable to care for oneself (Martínez Pincay & Guarnaccia, 2007). Many times traditional folk practices and remedies are first used to treat depression (Lopez, 2005).

For Latino women, these challenges are all intertwined and connected to the particular circumstances in which they find themselves. While the convergence of all these factors seems overwhelming, it is important to remember that Latino immigrants as a group have better mental health than U.S-born Latinos (Martínez Pincay & Guarnaccia, 2007). But for those Latino immigrants who do develop depression, both the sources of depression and the barriers to care are variously determined. Thus, there is a need for increased understanding of depression experienced by rural Latino women. Information gained through this research can be used to develop interventions to better understand and prevent depression and thus promote well-being among Latinos.

Purposes of Present Study

Little is known about how rural Latino women view depression. A greater understanding of how depression affects rural Latino mothers was gained by using a concurrent triangulation mixed

methods design (Creswell and Plano, 2007) in this study. The purpose of this study was to explain both qualitatively and quantitatively the level of depressive symptoms of low-income Latino mothers living in rural areas. Depressive symptoms were categorized to investigate different circumstances of the women's depressive symptoms: (a) consistently low level of depressive symptoms and (b) consistently high level of depressive symptoms. Consistently low level of depressive symptoms refers to women who maintained a low level of depressive symptoms at all three interviews. Consistently high level of depressive symptoms refers to women who maintained a high level of depressive symptoms at all three interviews. Comparisons among these groups of low-income, rural Latino mothers were expected to illuminate the challenges faced by these mothers for stable long-term low levels of depressive symptoms and to help educate policy makers and social support agency personnel make informed decisions regarding mental health needs of this population.

Methods

Sample

This study drew its sample of 103 rural Latino women from the multi-state Rural Families Speak (RFS) research project (Bauer, 2004). Mothers were interviewed annually over a three-year period. Mothers were asked questions such as, "How often during the last month did friends/relatives (not including partner) give you practical help?" and "Does this neighborhood/area have everything that you and your family need?"

Most of the mothers resided in California, Michigan, Oregon, and Iowa. All but five families qualifying for this current study came from these four states. The remaining five resided in Indiana, Massachusetts, Minnesota, and Ohio. The majority of those women in California were either first-generation or second-generation immigrants, while the women in Michigan were typically members of migrant households. The Latino families in both Oregon and Iowa were semi-settled. In Oregon, agricultural and construction industries attracted Latino laborers; in Iowa the major industry for Latino workers was meat packing companies.

Purposive sampling was used in this study to identify Latino mothers age 18 and older with at least one child 12 years old or younger, and whose household incomes were at or below 200% of the federal poverty line at the baseline interviews. Mothers were recruited in person and by phone through community organizations and services such as Latino community outreach offices, community action agencies, County Cooperative Extension Educational programs such as Expanded Food and Nutrition Education Program (EENEP), Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and Head Start.

According to the baseline information, the 103 mothers who responded in Wave 1 ranged from 18 to 48 years of age, with a mean of 31.5 years old. They had from 1 to 7 ($X = 2.8$) children. In addition, the households had a range of 2 to 11 ($X = 5.6$) family members living in the household. Approximately 88% of the mothers had a partner in their household by marriage or cohabitation. Approximately 41% of the mothers had completed at least high school or a G.E.D. The average household monthly income was \$1,794.

Measures

Maternal depressive symptoms. The Center for Epidemiologic Studies Depression Scale (CES-D) was used to assess depressive symptoms. CES-D is a 20-item, self-report or interviewer-administered instrument used to capture the level of depressive symptoms during the previous week (Radloff, 1977). Examples of statements include “I was bothered by things that usually don’t bother me” and “I talked less than usual” with four items reversed coded. Responses to items on the CES-D use a 4-point Likert scale with “0” representing rarely or none of the time, less than 1 day/week, “1” representing some or a little of the time, 1-2 days/week, “2” representing occasionally or a moderate amount of time, 3-4 days/week, “3” representing most or all of the time, 5-7 days/week.

Scores for CES-D range from 0 to 60 with higher scores indicating greater severity of depressive symptoms. Radloff’s (1977) research using the CED-D demonstrated that it is a psychometrically sound instrument; reliability for the CES-D is $\alpha = 0.85$ in the general population

and $\alpha = 0.90$ in psychiatric populations. In addition, the construct validity of the CES-D scale has been demonstrated on a community prevalence study in which the prevalence rate of clinical depression derived by a CES-D cut point set at 16 was similar to other self-report depression scales (Weissman & Myers, 1978). Furthermore, factor analysis has shown that the factor structure of the scale is consistent across racial groups (Roberts, 1980). In this study, reliability for the CES-D was $\alpha = 0.897$.

USDA Core Food Security Module (CFSM). Food security status was measured by the 18-item U.S. Household Food Security Module with a 12-month reference period (Hamilton, Cook, Thompson, Buron, Frongillo, Olson, & Wehler, 1997). Examples of questions include: (a) In the last 12 months, since last (name of current month), did you (or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food? (b) In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food? and (c) In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food? The food security score is indicated by a continuum of scores ranging from zero to ten. A household's score depends on the number of increasingly severe indications of food insecurity that the household has experienced, as indicated by affirmative responses to the increasingly severe sequence of survey questions. Since the scale measures the severity of food insecurity, the condition of fully secure represents the absence of the measured condition and is assigned a value of 0 (Bickel, Nord, Price, Hamilton, & Cook, 2000; Nord & Coleman-Jensen, 2009).

Households can be categorized as food secure or food insecure with the former having subsets of high food security and marginal food security and the latter having subsets of low food security and very low food security. Households are categorized as food secure if they provide two or fewer affirmative responses. When a household reports no indications of food-access problems or limitations, the household is described as having high food security. If the household reports one or

two affirmative responses, the household members are described as having marginal food security. Typically these members have anxiety over having enough food in the house but report little, if any, indication of changes in diets or food intake. Households are categorized as food insecure if they provided three or more affirmative responses. When a household reports having a diet that consists of reduced quality, variety, or desirability with little, if any, indication of changes in food intake, the household is described as having low food security. Finally, if the household reports both disrupted eating patterns and reduced food intake, then the household is described as having very low food security (Bickel et al., 2000; Nord & Coleman-Jensen, 2009).

In this study, food insecurity was used as a continuous variable to represent intensity of food insecurity (Gundersen, Weinreb, Wehler, & Hosmer, 2003). The scale has good validity and reliability, with a reliability coefficient of $\alpha = 0.81$ for households with children (Hamilton et al., 1997). The CFMS is similarly reliable for populations of racial and ethnic minorities (Frongillo, 1999). In this study, the CFMS has a reliability coefficient of $\alpha = .794$.

Knowledge of community resources. Knowledge of community resources was measured by using the 22-item Knowledge of Community Resources Index (Richards, 1998). This index asks mothers to indicate if they know how to find specific services within the community such as job training and child care, asking questions such as “Do you know how to find a mental health counselor?” and “Do you know how to apply for WIC?” The knowledge of community resources score was calculated by summing the number of items with an affirmative response. A higher score indicates a greater knowledge of community resources which is an indicator of resource management skills and support available to families. Since the measure is an index rather than a scale, it is not assumed that the frequency of items within Knowledge of Community Resources Index should be internally consistent. Therefore, reliability of the measure is not applicable.

Life skills. Life skills were measured by using the 25-item Even Start Life Skills Assessment (Richards, 1998). This index asks mothers to indicate which life skills they possess such as “Do you

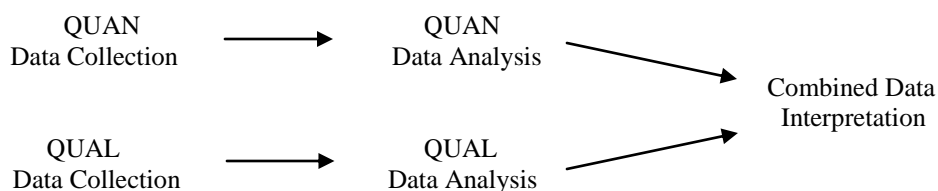
know how to stretch your groceries to the end of the month?” and “Do you know how to create a personal support system?” The life skills score was calculated by summing the items with an affirmative response. A higher score indicates that the participant has more life skills. Since the measure is an index rather than a scale, it is not assumed that the frequency of items within Life Skills Index should be internally consistent. Therefore, reliability of the measure is not applicable.

Sociodemographic variables. Four sociodemographic variables were analyzed for this particular study: (a) language acculturation; (b) educational level; (c) social roles; and (d) annual household income. Language acculturation, defined by the interview language used, was a binary variable. The two languages included were English and Spanish. Educational level was a binary variable that included the choices of less than a high school education and at least a high school education. Social roles were measured by the number of social roles that a mother performed. In this study, social roles were determined in the following way: a score of 1 for having the role of mother; a score of 2 for having the role of mother plus the role of either employee or student; and a score of 3 for having the roles of mother, employee, and student. Finally, annual household income was a continuous variable that included all household gross income.

Analytical Procedure

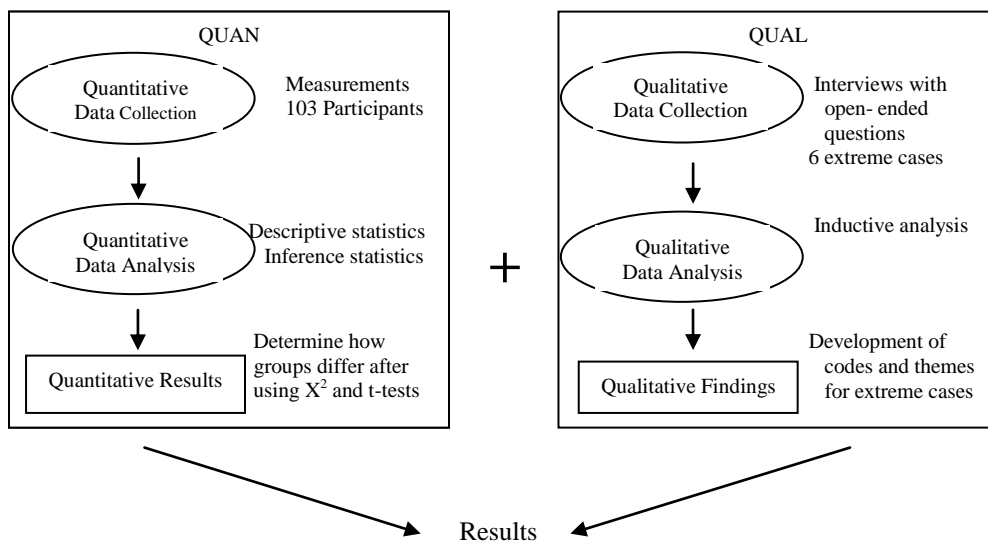
The study used quantitative and qualitative data gathered from mothers during annually in-depth interviews over three years to explain the level of depressive symptoms of low-income Latino mothers living in rural areas. A concurrent triangulation mixed methods design (see Figures 1 and 2)

Figure 1. Visualization of the Concurrent Triangulation Mixed Methods Design



was used as a means to corroborate findings (Creswell, 2003). Triangulation began with simultaneously collected quantitative and qualitative data that were analyzed separately. The quantitative data analyses assessed the relationships between the variables while the qualitative data analysis provided a rich description of commonalities and differences of the two groups of mothers—those with low depressive symptoms and those with high depressive symptoms. The final conclusions are based on analyses of both data types; results from the quantitative and qualitative approaches are used to cross-validate and confirm findings within this study (Creswell, 2003; Creswell & Plano, 2007; Creswell, Plano, Clark, Gutmann, & Hanson, 2003).

Figure 2. Elaborated Visualization of the Concurrent Triangulation Mixed Methods Design



Quantitative analysis. The 103 cases that responded in Year 1 (baseline wave) were included in the quantitative analysis. Quantitative analytical methods assessed the differences between depressive symptoms status with language acculturation, educational level, food security status, knowledge of community resources, and life skills. In addition, the social roles variable also was assessed due to its significance in the qualitative analysis. Chi-square and difference of mean tests (t-

tests) were used to test for associations between the variety of variables and level of depressive symptoms. All of the sociodemographic measures came from year 1 in order to clarify time order between socio-demographic variables and maternal depressive symptoms. Table 1 lists the demographic characteristics in relation to participants' depressive symptoms status.

Table 1

Demographic characteristics by mothers depressive symptom status (N = 103)

Variable	Depressive Symptom Level	
	Low (n = 56)	High (n = 47)
	M(SD)	
Mothers' age	31.29 (6.22)	31.80 (6.51)
Number of children	3.12 (1.51)	2.42 (1.19)
Age of youngest child in household (years)	3.65 (2.72)	3.91 (2.72)
Total number of family members	5.93 (1.78)	5.23 (1.87)
Monthly Income	\$1764.35 (642.20)	\$1828.7 (839.30)
	N(%)	
Marital status		
Single	6 (10.7%)	6 (12.8%)
Married	50 (89.3%)	41 (87.2%)
Mothers' interview language		
English	22 (39.3%)	21 (44.7%)
Spanish	34 (60.7%)	26 (55.3%)
Mothers' educational level		
Less than high school education	34 (60.7%)	26 (55.3%)
High school education or higher	21 (37.5%)	20 (42.6%)
Mothers' roles		
Parent	56 (100%)	47 (100%)
Employee	28 (50%)	24 (51.1)

Qualitative analysis. For the qualitative analysis, a sub-sample of 6 Latino mothers who consistently had the most extreme CES-D scores (3 in the consistently low and 3 in the consistently high depressive symptoms groups) over three years were selected. These 6 mothers were identified by separating the mothers into groups based on their depressive symptoms scores which were determined from their quantitative responses to the CES-D over the three interview waves. Table 2 lists the demographic characteristics in relation to participants' extreme depressive symptoms status.

Table 2

Demographic characteristics by mothers' extreme depressive symptom status (N = 6)

Variable	Depressive Symptoms Level	
	Extreme low	Extreme high
	(n = 3)	(n = 3)
	M (SD)	
CES-D score	3 (3.61)	27.33 (11.93)
Mothers' age	27 (5.57)	29 (7.21)
Number of children	2 (1.00)	2 (1.00)
Age of youngest child in household (years)	2.33 (2.52)	3.67 (.58)
Total number of family members	5.33 (1.15)	5 (2.00)
Monthly Income	\$2318 (907)	\$1895 (879)
	N (%)	N (%)
Marital status		
Single	0 (0%)	1 (33.3%)
Married	3 (100%)	2 (66.7%)
Mothers' interview language		
English	2 (66.7%)	3 (100%)
Spanish	1 (33.3%)	0 (0%)
Mothers' educational level		
Less than high school education	1 (33.3%)	0 (0%)
High school education or higher	2 (66.7%)	3 (100%)
Mothers' roles		
Parent	3 (100%)	3 (100%)
Employee	1 (33.3%)	2 (66.7%)

Inductive analysis was used to identify any emergent themes. The analysis of the qualitative data began with an intense review of verbatim transcripts of interviews. Using an approach similar to what Esterberg (2002) referred to as open coding, categories for each of the two depressive symptoms groups were identified line by line in the transcripts. Once several recurring themes appeared, I began focused coding (Esterberg, 2002). This time the coding focused on key themes identified during open coding and were identified line by line, sentence by sentence, or paragraph by paragraph in the transcripts for both of the two depressive symptom groups. During focused coding, the themes were broken down into components and/or subsequent themes. This process generated detailed descriptive summaries of the data. A careful audit trail was maintained in a journal to ensure coding

categories remained clear and consistent with what the participants of each group actually said. The coding scheme was inductively refined throughout the analytical process.

Results

Results of Quantitative Analysis of Total Sample

Table 3 shows results of the frequencies, chi-square, and difference of means tests in relation to participants' depressive symptoms status. Items of interest, namely language acculturation, educational level, food security status, knowledge of community resources, and life skills were analyzed. In addition, items that related to the important categories found through qualitative analysis, namely number of roles, number of moves during childhood, social service agencies used, and participation in specific programs were included in the analyses.

Based on results of the chi-square analysis, the number of children these rural low income Latino mothers had was moderately significant, indicating that the total number of children a mother had may not be independent other level of depressive symptoms. Furthermore, the test indicated that the mean number of children of mothers with low depressive symptoms differed significantly from the mean number of children of mothers with high depressive symptoms, with the former group having significantly more children. In addition, the chi-square analysis provided a moderate indication that children's school lunch participation may also not be independent from mothers' level of depressive symptoms. The t-test also indicated that the mean number of children's school lunch participation differed significantly, albeit moderately, depending on mothers' level of depressive symptoms. Furthermore, the number of life skills a mother possessed was moderately significant suggesting that a mother's life skills are not independent from her level of depressive symptoms. The t test also provided moderate evidence that the mean number of life skills was related to the mother's level of depressive symptoms.

Chi-square analyses identified two additional variables in which the observed values differed significantly from the expected values, indicating that the variables are related to the mothers' level of

depressive symptoms. The food insecurity score was significant, indicating that a household's food insecurity score may not be independent from the mother's level of depressive symptoms.

Table 3
Frequencies, chi square and difference of means tests (N=103)

Variable	Depressive Symptom Level		Chi Square	df	T-test	df
	Low (n=56)	High (n=47)				
	M (SD)					
CES-D Score	7.88 (3.97)	23.10 (7.17)	103**	33	-12.99**	68.91
Mothers' age	31.29 (6.22)	31.80 (6.51)	25.841	26	-0.40	99
Number of children	3.12 (1.51)	2.42 (1.19)	11.903†	7	2.57**	101
Age of youngest child in household	3.65 (2.72)	3.91 (2.72)	39.179	40	-0.48	99
Total number of family members	5.93 (1.78)	5.23 (1.87)	11.011	9	1.93†	101
Monthly Income	\$1764.35 (642.20)	\$1828.71 (839.30)	94.132	90	-0.04	101
Knowledge of community resources	13.57 (5.37)	11.32 (5.03)	17.93	21	2.10*	93
Life skills	16.42 (4.67)	16.10 (4.86)	28.10†	20	0.31	83
Food insecurity score	2.89 (3.32)	3.74 (3.98)	25.34*	13	-1.19	101
Social support agencies, number of	2.94 (1.27)	2.40 (1.40)	8.77	7	1.95†	92
Moves as child	2.49 (4.18)	3.86 (7.70)	13.11	12	-1.03	61.02
	N (%)		Chi Square	df	T-test	df
Married/Cohabiting	50 (89.3%)	41 (87.2%)	0.104	1	0.32	101
Language acculturation (English)	22 (39.3%)	21 (44.7%)	0.306	1	0.55	101
Less than high school education	34 (60.7%)	26 (55.3%)	0.291	1	-0.54	99
Mothers' roles, 2 or more	29 (51.8%)	28 (59.6%)	0.73	2	-0.71	101
SNAP participation	10 (19%)	8 (19%)	0.01	1	0.08	93
WIC participation	36 (64%)	27 (57%)	0.5	1	0.70	101
School lunch participation	47 (84%)	31 (67%)	3.84*	1	1.93†	84.18
Child care assistance participation	24 (43%)	14 (30%)	1.88	1	1.38	100
Housing assistance participation	3 (5%)	4 (8%)	0.4	1	-.63	101
Energy/fuel assistance participation	9 (16%)	8 (17%)	0.02	1	-.13	101
Medicaid participation	35 (62%)	27 (57%)	0.27	1	0.52	101

Note: Data are based on Year 1 information

† $p \leq .10$, * $p \leq .05$, ** $p \leq .01$

T-test analyses identified three additional variables for which the means of the two groups of mothers—low depressive symptoms and high depressive symptoms—differed significantly from one another. First, the t-test analysis revealed that one's knowledge of community resources differed significantly between the two groups of mothers and that one's total number of family members and the use of different social supports programs differed significantly, albeit moderately, between the two groups of mothers.

Table 4 shows the frequencies for the six participants with extreme depressive symptoms status. Differences between the two groups of mothers—low depressive symptoms and high

depressive symptoms—were observed in five variables between these extreme cases. The group of mothers who consistently had low depressive symptoms had a lower food insecurity mean than the group of mothers who consistently had high depressive symptoms, meaning they experienced greater food security as a group. In addition, the mothers who consistently had lower depressive symptoms had greater knowledge of community resources but did not utilize as many social support programs as did the mothers who consistently had higher depressive symptoms, including the school lunch program.

Table 4
Frequencies of sociodemographic variables (N=6)

Variable	Depressive Symptom Level		
	Extreme low	Extreme high	(n
	(n = 3)	= 3)	M
	M (SD)	(SD)	
Food Insecurity score	3 (3.00)	3.33 (5.77)	
Knowledge of community resources score	14.33 (5.03)	12.33 (5.77)	
Life skills score	21.33 (2.08)	18.67 (2.52)	
Social support agencies used	3.00 (1.00)	4.00 (1.73)	
Number of moves during childhood	.00 (.00)	3.33 (4.93)	
	N (%)		
SNAP participation	0 (0%)	1 (33%)	
WIC participation	3 (100%)	3 (100%)	
School lunch participation	2 (67%)	3 (100%)	
Child Care Assistance participation	1 (33%)	2 (67%)	
Housing Assistance participation	0 (0%)	1 (33%)	
Energy/fuel Assistance participation	1 (33%)	0 (0%)	
Medicaid participation	2 (67%)	2 (67%)	

Note: Data are based on Year 1 information

Results of Qualitative Analyses of Extreme Cases

From the qualitative analysis, the two groups had apparent differences. First, mothers with low depressive symptoms averaged 6,692 words per interview, while the interviews of women with

high depressive symptoms averaged 9,004 words per interview. Furthermore, other dissimilarities included three major categories in which women with low depressive symptoms differed from those women with high depressive symptoms over the three waves of interviews. The categories are: (a) Familial Relationships—family of origin and spouse, (b) Multiple Social Roles, and (c) Financial Difficulties. The findings for each of these categories will be examined in the following subsections.

Familial Relationships

Because this research explored commonalities and differences among two groups—low depressive symptoms group and high depressive symptoms group—of rural low income Latino mothers with young children, it is important to begin this process by understanding the personal histories and current realities of the mothers studied.

Family of origin. Differences between their families of origin is a theme that emerged when analyzing the interviews for the low and high depressive symptoms groups. The low depressive symptoms group grew up in families that never moved and in which they felt unconditional love. Their families, particularly their parents, were viewed as a source of strength and support. Clarita summed this emotional closeness, stating “[What I remember about my childhood is] the love and care my parents gave me. And the bonding between the family.” The high depressive symptoms group, however, perceived their families of origin as being detached and uninvolved. Estela described moving multiple times during her childhood, stating:

It was very hard. [I lived with] my sister...a few years in L.A. Other years I live here in town. Some other years I live in Mexico with my other sister over there. We were moving a lot from different places. And we didn't, well I hardly got to see, like, my parents. Cuz they were like doing work, or, doing I don't know what...

In addition, fathers were seen as being unsupportive and judgmental. Maryann described how she felt growing up,

My, my parents were, especially my father, you know, old world Hispanic man, doesn't like, you know, girls to do anything, you know, that would, you know, dare shame the family

name [laughing]. I was, I was very watched over....there was just, yeah, there wasn't a whole lot of room to, to blow it.

Furthermore, the low depressive symptoms group's families of origin had remained emotionally close. In addition, two women in this group lived in close proximity to their families of origin. Moreover, these women were able to depend on their parents and siblings in time of need. Ynez explained this dependability by stating,

My family helps me out a lot. Usually my sisters or my mom will take him (son) to the doctor for me. If I couldn't, you know, get out. ...I think we're a close family we help each other any way we can. We're a loving family. And we all get along pretty good, I think....My mother...[and] my sisters. They're very important. My sisters and brothers...they're both pretty important to me.

All three of the women with low depressive symptoms had reciprocal relationships with their families. Family members helped the mothers meet their housing, food, childcare, and transportation needs. All three of the mothers had lived with an extended family member at some point, while two mothers considered their living arrangements permanent. By sharing housing and food costs and by having low cost or no cost childcare arrangements, the mothers in the low depressive symptoms group felt the support they needed from their families of origin.

However, throughout the study, the high depressive symptoms group reported they have not consistently felt this luxury. Although the women reported receiving support from their families, such as advice, loans, and childcare, these did not outweigh the lack of emotional support and/or burdens they felt. One mother, Maryann, felt her relationship with her father deteriorate over the duration of the study. Estela reported never receiving help from relatives but reported helping several of her relatives, namely several in-laws. The remaining mother, Gabina, felt that her brother and father caused her stress and her in-laws pressured her to work rather than go to school. Furthermore, Gabina reported the added stress she felt due to her parents' illnesses:

So I try, I've been taking a lot of responsibility for their, cause my dad's already 67 and my mom's 57 so I've been taking a lot of, taking care of their bills, the things that they can't do....my dad doesn't speak English that well and he doesn't even read....My mom right now has renal failure....my dad has been getting worse, he's

throwing up blood. He is an alcoholic and he smokes. My brother has been gone to jail and has been out for a year and half longer than he usually is, but he is not stable right now either....So, I'm like the most responsible right now and everyone is putting pressure on me, not purposely, I don't think, but I'm the one who's going to have to be taking care of all that [financial problems and wills] before my dad gets any worse. My mom has renal failure, so she won't take care of this before she passes away.

Spouse. There were also differences in how the women from the two groups perceived the support they received from their spouses, as well. All women in the low depressive symptoms group described their relationship with their husbands as being very positive. Clarita stated, "We have a good relationship. A lot of love, you know, trust. Support....we're willing to help each other out more....He helps me a lot." In fact, each husband was viewed as being very supportive of his wife's goals and actively involved in parenting his children. Husbands helped with everyday parenting needs such as helping children with homework, disciplining children, and providing the primary care of the children when the participants needed to do other things such as go to work or studying for school. Ynez stated, "[My husband] he helps in every way. He, well, he helps me raise and discipline [my son]. Financially [he helps our family]. He's also loving. He's a father figure for him [my son]."

On the other hand, all women in the high depressive symptoms group reported low levels of support from their husbands for various reasons. Maryann was a single mother who lived with her parents. Her ex-husband caused stress for her in several ways; when he picked up the children and when he dropped them off, he did not follow the previously agreed upon times. He also let the children engage in developmentally inappropriate activities, such as allowing their elementary school-aged child to watch the horror movie Scream, which is rated R. In addition, he sporadically missed his child support payment. Another woman found her husband's promotion to be difficult since he began working 12- hours shifts. His willingness to help with parenting when he was home was hindered by his unavailability due to long work hours. In addition, when he was home, he did not enforce the rules which led to frustration and feelings of low levels of support for Gabina. Finally, throughout the study, Estela consistently felt a lack of both emotional and physical support from her

husband which culminated when she became disabled and her husband did not change his level of support. Estela described this lack of support by asserting,

Sometimes I feel like my husband does made things tough for the family....[I feel] not very much [parenting support from my husband]. Well, he would say, "Well, have your mom do this. Have your mom help you with this. You help her. You should be taking care of this." Instead of him trying to figure it out, so instead of support, he relies on me....It's kind of hard for me right now. Sometimes I don't feel like dealing with anything, like homework, or they refuse to do their homework, and he just asks me "Make sure they do their homework, tell them to do it." I'm like, "You're the dad, too, you know." You know, "You're home." And he's more like, "No, I wasn't home" or "I have to go do an errand. I need to wax the car." Whatever excuse he wants to find to be out of the house. That way he doesn't feel responsible for it....if Tadeo would help me more with the girls. And help more around the house. Helps me more with girls and helping around the house when I work. [Since I've been disabled I haven't seen him doing more] not really, still the same.

Multiple Roles

When examining different roles that these mothers chose or indicated they had, the key roles included mother, employee, and student. There were variations in the number of roles reported by the women in the two groups. Participants who were in the low depressive symptoms group had fewer roles in their lives, while mothers in the high depressive symptoms group had more roles. All three women in the low depressive symptoms group never had more than two simultaneous roles. Drina consistently worked throughout the study. Although she knew that education was important, she chose to not further her education in order to be available for her family, stating

One has to study a lot and I don't have time. I have to rush back from work to have everything ready for everybody and then do this and that....well, the truth is I haven't made any effort because I'm always working. (To get ahead that's what you have to do-get an education), I know, but no, I haven't made the effort to obtain any training.

Clarita was a student throughout the study. At her last interview, she told how she had graduated from college with a degree in elementary education and was currently working as a substitute teacher while completing her teaching credential. Finally, Ynez took a year off from school during the second year of the study when she became a mother for the second time.

All mothers in the high depressive symptoms group, on the other hand, experienced more roles which resulted in elevated levels of role conflict. They all had, at some point during the study, experienced all three roles simultaneously. At the beginning of the study, Estela was working at a stressful job where she was expected to perform many extra duties that were not part of her original job description. During the second year, she changed jobs and went back to school, as did her husband. However, a car accident left her disabled by the last interview and her new job had been eliminated. Therefore, she was unemployed and had quit school. During the middle of the study, Gabina became a student and an employee. However, she decided to quit her job “because it was too much with school and work,” and she “wanted to concentrate on school.” In the last year, Gabina spent two hours round-trip commuting to the state university to which she transferred. Finally, Maryann spent the majority of the study as a student and employee. However, by the third interview, she was unemployed and was no longer a student due to recent health concerns and an automobile accident that totaled her car.

Financial Difficulties

Several differences were observed when examining the financial difficulties of the two groups. All participants from the low depressive symptoms group continually stated that their family’s economic situation had improved from the previous year. In addition, these women consistently indicated that their income was enough to purchase necessities and some wants. Clarita and Ynez both indicated that paying off their debt, such as credit cards and automobile loans, was difficult and Drina listed that purchasing food, clothing, medical care, and waste disposal services were difficult.

Although all mothers in the high depressive symptoms group began the study viewing their economic situation as the same or as improved from the previous year, by the final interview they all indicated that their economic situation had worsened. Furthermore, these women consistently viewed

their income as being enough to purchase only necessities. Gabina indicated several different items that were difficult for her to purchase; Gabina was focused on paying off credit card debt, stating,

Now that our rent is up, it's hard to pay for everything....and our income, even though we are making a lot more money now, it's still not enough, you know, to, you know, to, for us to go out or, you know, we, we still have to pay our credit card, I mean, our major, our major issue right now is our credit cards, want to pay them off first. And then there'll be a, like a whole, lift off my shoulders.

Estela and Maryann both indicated many different items that they had financial difficulties covering, such as food, clothing, medicines, credit card payments, personal care items, car registration, insurance (car, medical, and dental), utilities, car repairs, dental and medical care, school expenses, and childcare. Estela described their financial situation by saying, "No money for food. We take care of the payments on the house and, the car, the utilities. And, maybe medication for the girls. And then we could cut down on the food." Furthermore, Estela stated that her family had sold her teen's car, collected cans, babysat, and pawned items to help make ends meet.

Discussion

The goal of this study was to examine depressive symptoms of rural, low-income Latino mothers with young children to understand the commonalities and differences between two groups, those with consistently low and those with consistently high levels of depressive symptoms over a three year period. By using a concurrent triangulation mixed methods approach to examine depressive symptoms, this study augmented the findings of each approach. The quantitative and qualitative analyses supplemented each other to provide a rich and in-depth understanding of depressive symptoms for this group of rural, low-income Latino mothers. The data showed that both groups of women had similarities and differences in their circumstances.

The quantitative findings revealed commonalities between the two groups of mothers, those with consistently low and those with consistently high levels of depressive symptoms. The mothers in both groups were of similar age and their youngest child was similar in age as well. In addition, both groups of mothers were married or cohabitated with their partners and had comparable sized

families with similar incomes. Others commonalities included that mothers in both groups were more likely to speak Spanish when completing the interviews and to have less than a high school education. Less than 20% of either group of mothers—consistently low and consistently high depressive symptoms—participated in Supplemental Nutrition Assistance Program (SNAP), housing assistance programs, or energy/fuel assistance programs. Over 50% of both groups of mothers participated in the WIC and Medicaid assistance programs.

Although the quantitative analyses showed that both groups of mothers were likely to be married or cohabitating with their partner, the qualitative analysis added insight to this finding. The differences between the two extreme groups of mothers revealed that the quality of the marital relationship is very important. All mothers in the extreme low depressive symptom group described their relationship with their spouse as having positive attributes, while the mothers in the extreme high depressive symptom group reported low levels of support from their current or ex-spouses.

The quantitative findings also revealed differences between the two groups of mothers. The mothers who consistently had low depressive symptoms reported having more children than the mothers in the high depressive symptom group. In addition, the mothers with low depressive symptoms reported having more life skills and knowledge of community resources than mothers with high depressive symptoms. Furthermore, this group of mothers indicated more participation in social support programs than the mothers in the high depressive symptom group. The mothers who consistently had low depressive symptoms reported more participation in the school lunch program than the mothers in the high depressive symptom group, 84% and 67% respectively.

The qualitative analysis revealed further differences between the two groups of mothers, those with consistently extreme low and those with consistently extreme high levels of depressive symptoms. The mothers who maintained extreme low depressive symptoms throughout this longitudinal study did so due to several factors: (a) loving and supportive families of origin, (b) warm and supportive husbands, (c) fewer social roles, and (d) fewer financial difficulties. These

mothers talked about how their families of origin and their spouses' families of origin provided an atmosphere in which they could flourish as individuals both in the past and present. Their extended families also provided them with a loving and stable home environment. These women could depend on their families in time of need. This finding is important because it highlights the significance that one's family of origin has throughout life. A caring and supportive relationship with one's parents and siblings appeared to buffer an individual from life's difficult circumstances and thus safeguard one's mental health.

The mothers who experienced extreme high levels of depressive symptoms reported the lack of caring and supportive relationships with their families of origin and their spouses. They could not depend on their parents, siblings, or spouse for support. As reported by the qualitative analysis of the extreme cases, this lack of support was intensified by their multiple social roles. They had more responsibilities with less support than their counterparts, the group of mothers with extreme low levels of depressive symptoms. Although the quantitative analysis of the total sample did not find significant differences between the means of the two groups of mothers, other studies have shown that multiple roles to be related to elevated depressive symptoms (Jagannathan, Camasso, & Sambamoorthi, 2010; Ronzio & Mitchell, 2010). In addition, several studies have shown the quality of the spousal relationship to be related to depressive symptom levels as well (Mamun, Clavarino, Najman, Williams, O'Callaghan, & Bor, 2009; McCue Horwitz, Briggs-Gowan, Storfer-Isser, & Carter, 2007).

A final difference found between the two groups of mothers who experienced extreme levels of depressive symptoms—low or high—is financial difficulties. The mothers who experienced extreme high levels of depressive symptoms reported more financial difficulties than their counterparts. However, the quantitative analysis of the total sample did not show significant differences between the means of the two groups of mothers when comparing monthly income and total number of family members. In addition, participation in social support programs differed only

marginally between mothers with consistently low and those with consistently high levels of depressive symptoms, 2.94 programs and 2.40 programs respectively.

Limitations of this study include not being able to take several detailed factors into account concerning specific familial relationships which emerged as an important theme in the qualitative analysis but were not measured quantitatively. For example, social support received from these familial relationships, specifically family of origin and spousal, was not thoroughly examined in the quantitative analysis. In addition, the findings of multiple social roles and financial difficulties were based on the number of social roles and difficult payments and/or purchases, respectively, and did not consider the degree of burden placed on the mother which may have altered the significance of these variables.

In spite of its limitations, this study provides significant contributions to understanding the nuances that contribute to elevated depressive symptoms among rural low-income Latina mothers. This study does show that familial relationships may have a stronger influence on depressive symptoms than experiencing financial strain or managing multiple social roles. Positive familial relationships played a key role in maintaining levels of low depressive symptoms as did being aware of community resources and being proficient in basic life skills.

Implications for Policy

Findings from this study can be used by community leaders to better serve the needs of rural, low-income Latino mothers and families. To address the mental health needs of mothers, community leaders can sponsor and extensively publicize programs that can address these needs, such as communication classes, parenting and financial education, and social support groups like Mothers of Preschoolers (MOPS). In addition, community leaders can advertise community resources through multiple used sources such as church bulletins, childcare and school newsletters, public television and radio channel announcements, and bulletin boards at local community centers such as public libraries

and recreational centers. In addition, Extension services can incorporate these findings to help meet the needs of rural, low-income Latino mothers.

Furthermore, policymakers can encourage social service employees to screen mothers for depressive symptoms. By addressing and preventing maternal depression, parenting behaviors can be improved leading to more positive attachment qualities between mother and her children (Zaslow, Bronte-Tinkew, Capps, Horowitz, Moore, & Weinstein, 2009). Secure attachment which reflects a history of sensitive and responsive interactions between mother and child has consistently been shown to influence an individual throughout one's life including marital relations (Bretherton, 1993). Such efforts have the potential to affect at least two generations: both the mothers' mental health needs and parenting behaviors, and the children's development over time and may be passed along from one generation into multiple generations later if it is not reversed.

Future Research

The need to continue to focus on rural, low income Latino mothers is great. Several meaningful extensions of this study exist. First, the influence of familial relationships on depressive symptoms needs to be further examined. Both past and present relationships affect one's mental health. Teasing out the intricacies of one's family of origin with one's family of procreation is necessary to effectively combat one's depressive symptoms. In addition, examining if differences exist in the relationship quality of those who are married as opposed to those who are cohabiting and how these differences, if any, influence maternal depression could inform legislatures as they reevaluate the social policies targeting families. Second, further examination of multiple roles and role conflict is needed among rural, low income Latino mothers. Jagannathan et al. (2010) found that Latino women experienced a 68% increase in depression when they were short-term welfare recipients in programs that stressed welfare-to-work. Investigating factors that specifically have a positive effect on Latino women's mental health is crucial to meeting their needs. Finally, a better understanding of how the financial difficulties between the two groups of mothers affected their

differing levels of depressive symptoms is needed to fine tune financial education among this target population.

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CHAPTER 4: GENERAL CONCLUSIONS

General Discussion

The purpose of this dissertation was to understand depression among rural, low-income Latino women. This dissertation used data from a previous data collection that included both qualitative and quantitative data and thus, one of the manuscripts for this dissertation used a quantitative methodology and the other used a mixed methods design to examine depression among rural Latino women. The two studies complemented each other providing a richer and deeper understanding of depression among this group of rural, low-income Latino women with families than either study provided alone. The data showed that the factors influencing depression are both complex and multi-faceted.

Two research questions were posed to facilitate an enhanced understanding of depression among rural, low-income Latino women. The first question examined the relationship between depressive symptoms and food insecurity. The second question examined the commonalities and differences between rural, low-income Latino women who have consistently low depressive symptoms with those who have consistently high depressive symptoms.

Through the use of latent growth curve modeling, the relationship between depressive symptoms and food insecurity among rural, low-income Latino mothers was examined. First, ethnicity moderated the relationship between food insecurity and depressive symptoms. Latino mothers had higher initial food insecurity levels than African American mothers and lower food insecurity levels than Caucasian mothers. Similarly, Latino mothers experienced greater changes in food insecurity over time than Caucasian mothers and less change than African American mothers. In addition, being Latina negatively influenced the initial level of and change in depressive symptoms over time.

Overall, the results from latent growth curve modeling are consistent with earlier research (Weinreb, Wehler, Perloff, Scott, Hosmer, Sagor, & Gundersen; 2002; Whitaker, Phillips, & Orzol,

2006) that higher food insecurity scores are associated with higher levels of depressive symptoms. Similarly, chi square analysis with the sample of 103 Latino mothers indicated that food insecurity scores were dependent on the mothers' level of depressive symptoms. However, the t-test analysis which compared the means of the mothers with consistently low depressive symptoms with the means of the mothers with consistently high depressive symptoms did not show a significant difference between the two groups.

Through the use of a mixed methods study, the commonalities and differences between rural, low-income Latino women who have consistently low depressive symptoms with those who have consistently high depressive symptoms were discerned. The quantitative findings revealed commonalities between the two groups of mothers, those with consistently low and those with consistently high levels of depressive symptoms. These commonalities included the following similarities: (a) age of mothers, (b) age of youngest child, (c) married/cohabitating arrangements, (d) family size, (e) household incomes, (f) greater likelihood to speak Spanish when completing the interviews, and (g) less likelihood to have a high school education. In addition, fewer than 20% of either group of mothers participated in SNAP, housing assistance programs, or energy/fuel assistance programs, while over 50% of both groups participated in WIC and Medicaid.

Although the quantitative findings showed that both groups of mothers were likely to be married or cohabitating with their partner, the qualitative analysis added insight to this finding. The differences between the two extreme groups of mothers revealed that the quality of the marital relationship is very important. All mothers in the extreme low depressive symptom group described their relationship with their spouse as having positive attributes, while the mothers in the extreme high depressive symptom group reported low levels of support from their current or ex-spouse.

The quantitative findings also revealed differences between the two groups of mothers. The mothers who consistently had low depressive symptoms reported significant differences from their counterparts with high depressive symptoms. Mothers who consistently had lower depressive

symptoms reported the following: (a) more children in the family, (b) more life skills, (c) greater knowledge of community resources, (d) participation in social support programs, and (e) greater participation in the school lunch program compared to mothers who had consistently high depressive symptoms.

The qualitative analysis revealed further differences between the two groups of mothers. The mothers who maintained extreme low depressive symptoms throughout this longitudinal study appeared to do so due to several factors: (a) loving and supportive families of origin, (b) warm and supportive husbands, (c) fewer social roles, and (d) fewer financial difficulties. These mothers talked about how their families of origin and their spouses' families of origin provided an atmosphere in which they could flourish as individuals both in the past and present. The mothers who experienced extreme high levels of depressive symptoms reported the lack of caring and supportive relationships with their families of origin and their spouses. They could not depend on their parents, siblings, or spouse for support. As reported by the qualitative analysis of the extreme cases, this lack of support was intensified by their multiple social roles. They had more responsibilities with less support than their counterparts, the group of mothers with extreme low levels of depressive symptoms. However, the quantitative analysis of 103 Latino mothers did not find significant differences between the means of the two groups of mothers.

A final difference found between the two groups of mothers who experienced extreme levels of depressive symptoms—low or high—is financial difficulties. The mothers who experienced extreme high levels of depressive symptoms reported more financial difficulties than their counterparts. However, the quantitative analysis of the total sample did not find significant differences between the means of the two groups of mothers when comparing monthly income and total number of family members. In addition, participation in social support programs differed only marginally between mothers with consistently low and those with consistently high levels of depressive symptoms, 2.94 programs and 2.40 programs respectively. These results seem to support

past research that found that the way a woman perceives her financial situation influences her level of depressive symptoms (Dolan, Richards, Sano, Bauer, & Braun, 2005; Marghi, 2004; Piescher, 2004; Simmons, 2006b; Simmons, Braun, Charnigo, Havens, & Wright, 2008) with a more negative view being associated with more depressive symptoms.

Ecological Theory of Human Development and Depression

According to the ecological theory of human development, an individual's development is affected by one's social contexts within a set of four reciprocal and interconnected ecological systems (Bronfenbrenner, & Morris, 1998). The four levels of influence include the microsystem (i.e., individuals and families), the mesosystem (i.e., social networks), the exosystem (i.e., community), and the macrosystem (i.e., larger cultural context). Although the exosystem and macrosystem could potentially contribute to understanding depression among low income Latino mothers, only the microsystem and mesosystem will be discussed relative to the findings of this research.

Microsystem: Individuals and Families.

Among the rural, low-income Latino mothers in the qualitative analyses of the extreme cases, several individual and family factors influenced the level of depressive symptoms. The Latino mothers with extreme low depressive symptoms reported less financial stress when compared to their counterparts with extreme high depressive symptoms. These mothers reported that they shared expenses with other household members such as family of origin and had less debt payments than mothers with extreme high depressive symptoms. In addition, Latino mothers with extreme low depressive symptoms had fewer social roles, meaning they could concentrate mainly on the role of mother with roughly half of the mothers also taking on the role of employee or student. Furthermore, the Latino mothers with low depressive symptoms had significantly more knowledge of community resources than did mothers with high depressive symptoms. Although overall Latinas as a group systematically had lower levels depressive symptoms than did Caucasians and African Americans mothers, initial food insecurity levels also were found to correspond with initial levels of depressive

symptoms with higher levels of food insecurity corresponding to higher levels of depressive symptoms.

Mesosystem: Social Network Factors

The key distinction between Latino mothers at this level was revealed in the qualitative analyses of the extreme cases. The differences in the quality of their familial relationships were paramount. Latino mothers with low depressive symptoms described positive relationships with their families of origin, their spouses' families of origin, and their spouses. Their families provided a loving and stable atmosphere in which they could flourish as individuals both in the past and present. This finding is important because it highlights the significance that one's family of origin has throughout life.

Limitations of the Present Study

Limitations of this study include not being able to take several detailed factors into account concerning specific familial relationships, which emerged as an important theme in the qualitative analysis; specific variables that assessed the quality of these relationships were not measured quantitatively. For example, social support received from these familial relationships, specifically family of origin and spousal, was not thoroughly examined in the quantitative analysis. In addition, the findings of multiple social roles and financial difficulties were based on the number of social roles and difficult payments and/or purchases, respectively, and did not consider the degree of burden placed on the mother which may have altered the significance of these variables. Furthermore, even though standardized measures were used to assess food insecurity and depressive symptoms, bias is possible since all data were self-reported.

In spite of its limitations, this study provides significant contributions to a deeper understanding of the nuances that are associated with depressive symptoms among rural low-income Latina mothers. The latent growth curve analysis revealed that ethnicity moderated the relationship between food insecurity and depressive symptoms and that Latino mothers had higher initial food

insecurity levels than African American mothers and lower food insecurity levels than Caucasian mothers. In addition, the qualitative analyses in this study illustrated that familial relationships may have a stronger influence on depressive symptoms than experiencing financial strain or managing multiple social roles. Positive familial relationships played a key role in maintaining extreme levels of low depressive symptoms.

Recommendations for Future Research

The need to continue to focus on rural, low income Latino mothers is great. Several meaningful extensions of this study are apparent. First, the influence of familial relationships on depressive symptoms needs to be further examined. Both past and present relationships affect one's mental health. Teasing out the intricacies of one's family of origin with one's family of procreation is necessary to effectively combat one's depressive symptoms. In addition, examining if differences exist in the relationship quality of those who are married as opposed to who are cohabiting and how these differences, if any, influence maternal depression could inform legislatures as they reevaluate the social policies targeting families. Second, further examination of multiple roles and role conflict is needed among rural, low income Latino mothers. Jagannathan, Camasso, and Sambamoorthi (2010) found that Latino women experienced a 68% increase in depression when they were short-term welfare recipients in programs that stressed welfare-to-work. Investigating factors that specifically have an effect on Latino women's mental health is crucial to meeting their needs. Third, a better understanding of how the financial difficulties between the two groups of mothers affected their differing levels of depressive symptoms is needed to fine tune financial education among this target population. Finally, further work is needed that considers differing patterns of association with food insecurity and maternal depression based on earlier familial relationships and child outcomes.

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APPENDIX A

IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 1/26/2011

To: Dr. Kimberly Greder
1086 LeBaron Hall

From: Office for Responsible Research

Title: Latino Immigrants: Tracking the Effects of Changing Public Policies on Family Well-Being

IRB Num: 04-039

Approval Date: 1/26/2011

Continuing Review Date: 1/29/2012

Submission Type: Continuing Review /
Modification

Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University. Please refer to the IRB ID number shown above in all correspondence regarding this study.

Based on the information you provided in Section II of the IRB application, we have coded this study in our database as being **permanently closed to the enrollment of new subjects, where all subjects have completed all research-related activities, and the study remains open only for data analysis.** To open enrollment or initiate research-related interaction with subjects, you must submit a modification and receive IRB approval prior to contacting subjects.

Even though enrollment of subjects has ended, federal regulations require continuing review of ongoing projects. Please **submit the Continuing Review and/or Modification form with sufficient time (i.e. three to four weeks) for the IRB to review and approve continuation** of the study, prior to the continuing review date. As a courtesy to you, we will send a reminder of the approaching review prior to this date.

Please be sure to **obtain IRB approval prior to implementing any changes to the study** by submitting the Continuing Review and/or Modification form.

You must **promptly report** any of the following to the IRB: (1) **all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems** involving risks to subjects or others.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

For IRB Use Only	Modification Approval Date <u>January 26, 2011</u>	RECEIVED JAN 21 2011 By IRB
	Continuing Review Approval Date <u>January 26, 2011</u>	
	Approval Expiration Date: <u>January 29, 2012</u>	

ISU HUMAN SUBJECTS CONTINUING REVIEW AND/OR MODIFICATION FORMTYPE OF SUBMISSION: ☐ Continuing Review ☐ Modification ☒ Continuing Review and Modification

Principal Investigator: Kimberly Greder		Phone: 515-294-5906
Degree: PhD	Correspondence Address: 1086 LeBaron Hall	
Department: Human Development Family Studies/Extension	E-mail Address: kgreder@iastate.edu	
Project Title: Latino Immigrants: Tracking the Effects of Changing Public Policies on Family Well-Being		
IRB ID: 04-039	Date of Last Continuing Review: 2/1/10	
Alternate Contact:		Phone:
Correspondence Address:		Email Address:
IF STUDENT PROJECT		
Name of Major Professor:	Phone:	E-mail Address:
Department:	Campus Address:	

FUNDING INFORMATION:

<input type="checkbox"/> External Grant/Contract	<input checked="" type="checkbox"/> Internal Support (no specific funding source) or Internal Grant (indicate name below)
Name of Funding Source:	OSPA Record ID on Gold Sheet:
<input type="checkbox"/> Part of Training, Center, Program Project Grant – Director:	Overall IRB ID No:
<input type="checkbox"/> Student Project—No funding or funding provided by student	

CONFLICT OF INTEREST

The proposed project or relationship with the sponsor requires the disclosure of significant financial interests that present an actual or potential conflict of interest for investigators involved with this project. By signing this form, all investigators certify that they have read and understand ISU's Conflict of Interest policy as addressed by the ISU Faculty Handbook (<http://www.provost.iastate.edu/faculty>) and made all disclosures required by it.)

Do you or any member of your research team have a conflict of interest? ☐ Yes ☒ No
 If yes, has the appropriate disclosure form been completed? ☐ Yes ☐ No

ASSURANCE

I certify that the information provided in this application is complete and accurate and consistent with proposal(s) submitted to external funding agencies. I agree to provide proper surveillance of this project to insure that the rights and welfare of the human subjects are protected. I will report any adverse reactions to the IRB for review. I agree that modifications to the originally approved project will not take place without prior review and approval by the Institutional Review Board, and that all activities will be performed in accordance with state and federal regulations and the Iowa State University Federal Wide Assurance.

Kimberly Greder 1/14/11
 Signature of Principal Investigator Date

Student Projects: Faculty signature indicates that this application has been reviewed and is recommended for IRB review.

Signature of Supervising Faculty _____ Date _____
 IRB Approval Signature Kerry A. Signtel January 26, 2011
 Date

For IRB Use Only	EXPEDITED per 45 CFR 46.110(b) <u>1, 2</u> , Category <u>8</u> , Letter <u>a, c</u>
	STUDY REMAINS EXEMPT per 45 CFR 46.101(b) _____
	WAIVER of SIGNED CONSENT per 45 CFR 46.117(c) _____
	WAIVER of ELEMENTS of Consent per 45 CFR 46.116 _____
	VULNERABLE POPULATION per 45 CFR 46 _____

DIRECTIONS: Section I: Key Personnel must be completed for all applications. Please complete Section II if this is an application for Continuing Review. If this is an application for continuing review and you will be modifying your project, please complete all sections of the form. **If this application is only to request approval for a modification or change to your study, please complete Section I: Key Personnel and Section III: Proposed Modifications or Changes.** Please answer each question. If the question does not pertain to this study, please type not applicable (N/A).

SECTION I: KEY PERSONNEL

List all current members of the project personnel, including any additions and excluding any deletions as described in Section III. This information is intended to inform the committee of the training and background of the investigators and key personnel.

NAME & DEGREE(S)	POSITION AT ISU & ROLE ON PROJECT	TRAINING & DATE OF TRAINING
✓ Kimberly Greder, PhD	Associate Professor, Project PI	9-19-00 human subjects training
✓ Christine Cook, PhD	Associate Professor, Project Co-PI	9-19-00 human subjects training
✓ Steve Garasky, PhD	Professor, Project Co-PI	9-19-00 human subjects training
✓ Samantha Young, Bachelor of Science	Graduate research assistant; data analysis; data management; literature review	8-17-09 human subjects training; graduate student, data analysis, literature; qualitative research and quantitative research methods courses
✓ Andrea Bentzinger, Master of Science	Graduate student, analyzing data	1-25-07 human subjects training, graduate student, data analysis, literature, completed masters thesis; qualitative research and quantitative research methods courses
✓ Flor Romero De Slowing, Bachelors	Graduate student, analyzing data, literature review	2-11-10 human subjects training, graduate student, data analysis, literature, translation; qualitative research and quantitative research methods courses
✓ Aryn Kruse, Master of Science	Graduate student, analyzing data	8/09 human subjects training; quantitative and qualitative graduate methods courses 8/30/04
✓ Jason Peck, Master of Science	Graduate student, analyzing data	May 2009; quantitative and qualitative graduate methods courses 5-19-09
✓ Lizmelia Ortiz, Bachelor of Science	Graduate student, analyzing data	8/29/03; human subjects training, graduate student, data analysis, quantitative research methods course
✓ Angelica Reina, Master of Science	Graduate student, analyzing data	9/07 human subjects training graduate student, data analysis, literature, translation; qualitative research and quantitative research methods courses 9-7-07
✓ Dawn Browder, Master of Science	Analyzing data; data entry	2/8/03 human subjects training

If you don't know your training date, contact the Office for Responsible Research for assistance.

SECTION II: CONTINUING REVIEW

Part A: Enrollment Status

1. ☒ Yes ☐ No Is the research **permanently** closed to the enrollment of new participants?
2. ☒ Yes ☐ No Have **all** participants completed all research-related interventions?
3. ☒ Yes ☐ No Does research remain active only for long-term follow-up of participants?
4. ☒ Yes ☐ No Are the remaining research activities limited to data analysis? OR
5. ☐ Yes ☒ No Participant enrollment has not begun and no additional risks have been identified.

For definitions and guidance on how to determine enrollment, please see the document entitled **Enrollment and Accrual of Study Participants** on the [IRB website](#).

Number of Participants Approved for Enrollment by IRB: 30	
Total Number of Participants Enrolled in the Study to Date:	Males: Females: 30
Number of Screen Failures (participants who were screened and deemed ineligible) to date: 0	
Check if any enrolled participants are: <input type="checkbox"/> Minors (under 18). Age Range of Minors: _ <input type="checkbox"/> Pregnant Women/Fetuses <input type="checkbox"/> Cognitively Impaired <input type="checkbox"/> Prisoners	Check below if this project involves: <input checked="" type="checkbox"/> Existing Data/Records <input type="checkbox"/> Secondary Analysis <input type="checkbox"/> Pathology/Diagnostic Specimens
List Below the Estimated Percent of the Total Enrolled That Are Minorities	
American Indians:	Alaskan Native:
Asian or Pacific Islander:	African American:
Black (Not of Hispanic Origin):	Hispanic: 100%

1. ☐ Yes ☒ No Have any participants withdrawn or have you asked any participants to withdraw from the study?

List number for each and reason for withdrawal:

--

Part B: Protocol Summary – Please use the amount of space needed to adequately address the questions.

1. Please provide a concise summary of the purpose and main procedures of the study.

To gather in-depth interview data from 30 rural, low-income Latino immigrant families in Iowa over a three year period in order to examine strategies used and obstacles faced in achieving economic self-sufficiency, and various dimensions (i.e., food security, housing security, mental and physical health) of family well-being.

2. Please provide a summary of how the study is progressing (e.g., progress to date in terms of the overall study plan, success or problems encountered, reasons enrollment has not begun, etc.)

Three waves of data were collected from 21 participants. The data continues to be analyzed. Three papers and two policy briefs have been written based on the data, one dissertation and one thesis have been completed using data from the study, two thesis and one dissertation are in preparation using data from the project.

3. Is there any new information (positive or negative) from this study (e.g., interim analysis) or elsewhere (e.g., current literature) that might affect someone's willingness to enroll or continue in the study? It is especially important for the investigator to notify the IRB of literature or information that's relevant to the risks to participants in the study.

No

4. Please provide a summary of amendments or modifications since last IRB review.

Part C: Adverse Events and Unforeseen Problems

1. ☐ Yes ☒ No Have there been any adverse events or unanticipated problems involving risks to participants or other people?

If yes, please describe the event(s).

If yes, was it reported to the IRB? Date reported

If report was not submitted, please explain why.

2. ☐ Yes ☒ No Have there been any participant complaints?

If yes, please describe.

Attach any reports submitted to NIH or a Data and Safety Monitoring Board. ☐ Attached ☒ N/A

Part D: Informed Consent

1. ☒ Yes ☐ No If a signed Informed Consent Form was required, was Informed Consent obtained from all participants?

If no, please explain.

2. ☒ Yes ☐ No Are all signed Informed Consent Forms on file with the PI?

If no, please explain.

3. ☐ Attached ☒ N/A Submit a copy of the currently approved Informed Consent Document or informational letter and an original unstamped copy so a current IRB approval stamp can be added. If changes have been made, please submit the original, a copy with the changes highlighted, and a copy to be stamped with IRB approval.

☐ Attached
☒ N/A

Submit an unstamped copy of all survey instruments, interview questions, recruitment materials, instructions, and all other material participants will see or hear during their participation so that a current IRB approval stamp can be added. Any changes to materials should be described in Section III. Please also submit the original, a copy with the changes highlighted, and a copy to be stamped with IRB approval.

SECTION III: PROPOSED MODIFICATIONS OR CHANGES

If this application is to request approval for modification or changes to your project, please complete Section I: Key Personnel and Section III.

The submission of a modification form is required whenever any changes are made to an approved project. This includes, but is not limited to, a title change, changes in investigators, resubmission of a grant proposal involving changes to the original proposal, changes in the funding source, changes to data collection materials and informed consent documents, advertisements, confidentiality measures, inclusion/exclusion criteria, reports from a data safety and monitoring board, addition of a test instrument, etc. **NOTE: All changes must be submitted and approved by the IRB prior to their implementation unless the change is necessary to protect the safety of participants.**

1. ☐ Yes ☒ No Does your project now require approval from another institution?

If yes, please attach letters of approval.

2. The following modification(s) are being made (check all that apply):

- ☐ Change in protocol/procedures.
☐ Change in type or total number of participants. New anticipated total:
☐ Change in informed consent document.
☐ Change in co-investigator(s). New co-PI name:

Signature of new Co-PI: _____

- ☐ Change in funding source/sponsor. **If federally funded**, please attach copy of grant proposal.
☐ Other (e.g., change in project title, adding new materials, adding advertisement, etc.)

- ☒ Personnel/staff changes since the last IRB approval was granted? Please complete the following table as appropriate. **NOTE:** If the change involves a new Principal Investigator, a new Human Subjects Review form must be submitted.

Add	Delete	Last Name	First Name
x		Kruse	Aryn
x		Peck	Jason
x		Reina	Angelica
x		Young	Samantha
x		Romero De Slowing	Flor
	X	Severson	Laura

3. Describe the modification(s) indicated above in sufficient detail for evaluation independent of any other documents. Be sure to describe all changes in detail and provide a rationale for the changes. When submitting revised documents please submit one clean copy of the new document and a copy with the changes highlighted.

There are new team members: Kruse, Peck, Reina, Young and Romero De Slowing; and a team member (Severson) is no longer with the project.

FOOTNOTES

¹I chose to use the term *Latino* since this is the term that has been consistently used by researchers using the Rural Families Speak project when discussing the Latino sub-population. According to the U.S. Census Bureau (2000), *Latino* refers to those who trace their ancestry to Latin America, whereas *Hispanic* refers to those who come from Spanish-speaking countries. Since the individuals who were studied in the Rural Families Speak project are from Latin America, Latino seemed to fit better.